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OLD DOG, NEW TRICKS

The real story of how Infinity Ward survived an internal war and the move to next-gen*

** Pictured: A real SAS dog employed by Infinity Ward to help finish its new Call of Duty*

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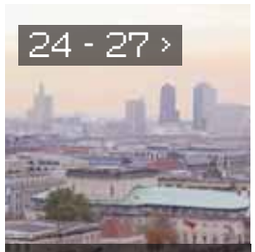
ISSUE 139 JUNE 2013

INFINITY WARD STRIKES BACK
Is the infamous studio back to its best with Call of Duty: Ghosts?



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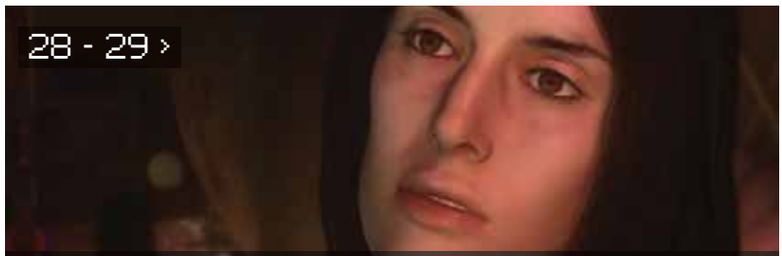
The dev hub in focus

PEOPLE POWER
Structuring studios

LOOK LIVELY
Why Agile still matters



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EDITORIAL

ONE TO WATCH?

ANY DEVELOP READER worth their salt would have watched the launch of Microsoft's new console, the Xbox One – even if you were already under NDA about the machine's architecture and design.

The unveiling was very different to that of the PS4. While Sony thrust Mark Cerny forward in a developer-centric event filled with details of GDDR5 RAM and accessible PC architecture, the Xbox One tumbled out of the blocks with a parade of execs talking up its live TV and Skype functionality.

Apparently, the team that designed the machine were led by the mantra 'Instant, Simple, Complete'. Perhaps the final console will be just that, but the announcement was far from clear.

The launch, streamed globally to congregated journalists and consumers, painted a slightly murky picture of a platform that supports film, TV, music and games in various ways. But just how it serves each distinctly was somewhat vague.

Apparently, the console – supported by three OSs – is backed by the most prolific phase of Xbox games development ever seen, and already numerous triple-A titles have been confirmed, such as *Call of Duty: Ghosts* (*on page 4*) and *FIFA 14*.

After the event, specs did emerge. The Xbox One features an eight-core CPU and is based on native 64-bit architecture. It will also include 500GB worth of hard drive space and 8GB of DDR3 RAM.

So is it firstly a games machine, or primarily a glorified set-top box? How open is the platform? And what are the opportunities for developers? Answers may not come until E3 – or later.

Will Freeman
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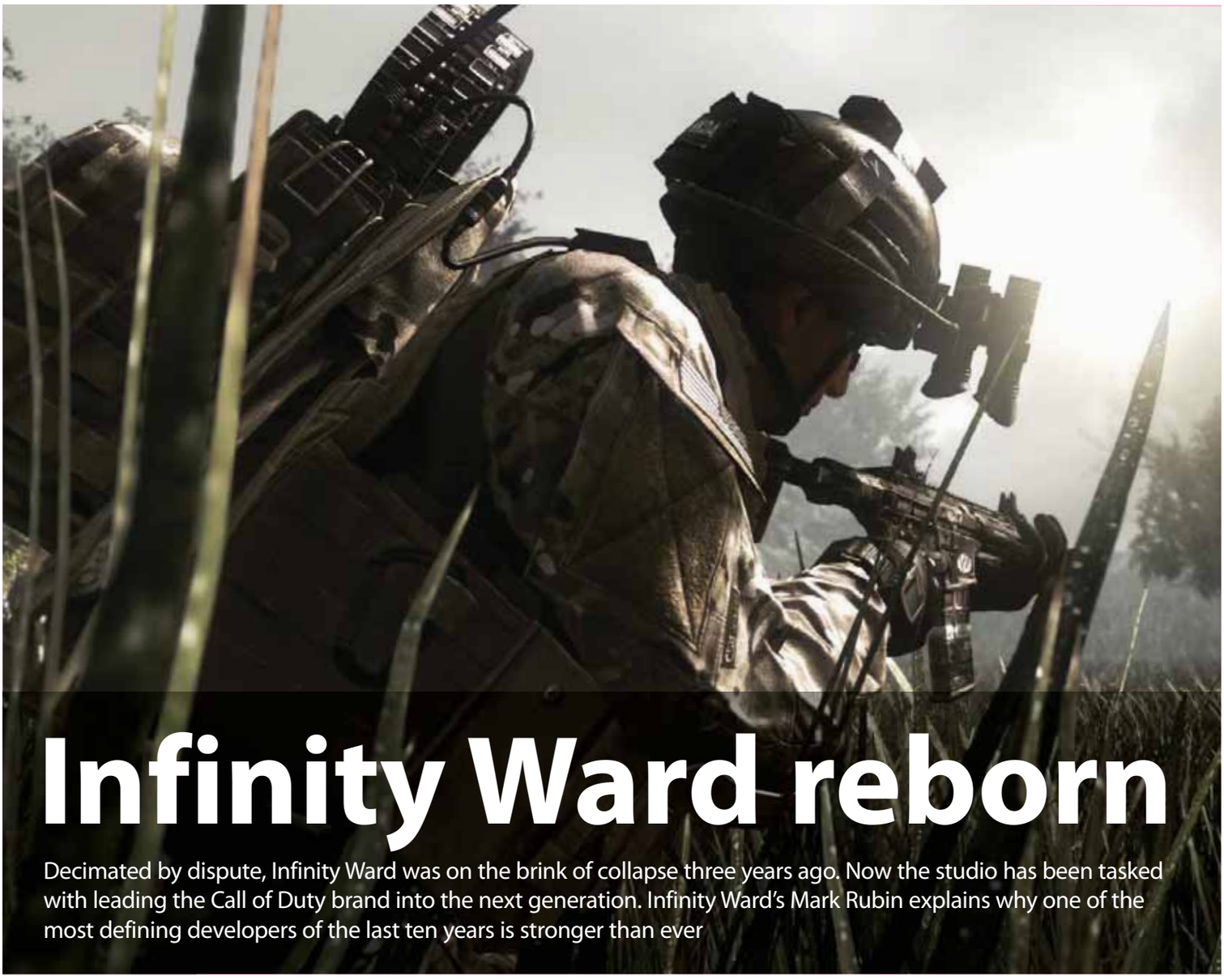
develop iPad

Videos are available within the iPad Edition of **Develop** on iTunes and the Browser-based Digital Edition, which can be accessed at **develop-online.net**

THIS MONTH: Call of Duty: Ghosts in motion **Epic Citadel running in HTML5 on the web** OptiTrack's Motive mo-cap middleware

Sponsored by Microsoft



Infinity Ward reborn

Decimated by dispute, Infinity Ward was on the brink of collapse three years ago. Now the studio has been tasked with leading the Call of Duty brand into the next generation. Infinity Ward's Mark Rubin explains why one of the most defining developers of the last ten years is stronger than ever

Infinity Ward's new executive producer, Mark Rubin (above), is leading development on Call of Duty: Ghosts (Main and above-right)

by Christopher Dring

MARCH 2010 WAS the month that saw Infinity Ward implode.

Over ten years the LA-based studio has established itself as one of the most important developers in the industry – from creating *Call of Duty* in 2003, to turning it into a phenomenon with *Modern Warfare* in 2007.

The team was good, and it knew it. Infinity Ward would control everything about its *Call of Duty* games, from the box art to the marketing campaign, to what went into the special editions. Its founders, Vince Zampella and Jason West, demanded respect from its parent company Activision, and they were not about to be pushed around.

Until they were pushed out.

In the wake of *Modern Warfare 2*'s release, Activision accused Zampella and West of colluding with its rival EA. Zampella and West subsequently accused Activision of bullying staff and withholding royalties. Both men were fired and so they set up their own studio, taking 46 members of their team with them, including senior animators and artists.

Infinity Ward was, quite literally, half the studio it was before. And had to team-up with sister developer Sledgehammer Games in order to finish work on 2011's *Modern Warfare 3*.

Online reports and rumours suggested Infinity Ward was all but finished. That *Modern Warfare 3* would be its final game.

But it survived.

> ***"Our experience with Modern Warfare 3 allowed us to re-grow the studio to full capacity at a pace that made sense to us."***
>
> Mark Rubin, Infinity Ward

THE REBUILDING PROCESS

"For *Modern Warfare 3*, we co-developed with Sledgehammer," recalls Infinity Ward executive producer, and development lead on the forthcoming *Call of Duty: Ghosts*, Mark Rubin.

"Early on we decided we needed to bring in someone to help us make that game. And what we didn't want to do was just to use an outsourcing company. We wanted a company that was as passionate about what they were doing as we were. And to do that we need to give ownership to them and let them own what they're working on and get behind it.

"Now that experience with *Modern Warfare 3* allowed us to re-grow the studio to full capacity at a pace that made sense to us. So it wasn't a situation where we went out and said 'Shit, we need 50 more guys; go out there on the street and hire them.' We were actually able to say 'no' to people and go out and hire the people that we wanted to hire. People that we would have hired even if the *Modern Warfare 2* thing didn't happened.

"We are always looking for the best talent, and we stayed that route. We are now a fully-fledged team. We are actually bigger than we have ever been before.

"That is the strangest thing for us, because with games getting harder and harder to make, it is taking more and more people. So this is something that would have happened regardless of that situation at all."

Indeed, since *Modern Warfare 2* Infinity Ward has become a far bigger studio. And during this rebuilding process, it has turned to the movie industry to add to its skillset. "Because we are in LA, we were able to bring in a lot of cool CG guys," explains Rubin.

"We hired basically the top two CG guys in the whole of Hollywood. These are the guys that did the faces and bodies of *Final Fantasy: Spirits Within*. They did the *Beowulf* movie.

Early concept art from Call of Duty: Ghosts suggests the series' typical polish and detail will once again be present

They did the CG parts in *The Animatrix*. These guys are the kings of what they refer to as the 'holy grail' of CG, which is basically making lifelike looking characters in CG. And they work for us now."

HOLLYWOOD TALENT

And these new Hollywood artists and animators have made a significant impact in how this new Infinity Ward team operates.

"They really brought a new vision of how our art assets were even created. They actually changed our pipeline," states Rubin.

"On the previous game – and previous engine actually – when we made an art asset we made it basically with a 'here's the polygon budget and here's the texture size budget.' And it was something that would be able to fit on all the platforms, so it is an average out of what all the consoles and devices can do.

"But these guys aren't used to that kind of development. They create art assets at cinema level, which is beyond next, next, next, next-gen.

"It's beyond PC right now. It is these really big cinema-quality assets. And what we can then do is pull them down onto the various platforms. That way the assets are always the best that they can be for that platform. So you never have an average, you have the best for PC, the best for current-gen, the best for next-gen.

> ***"We are bringing into gaming a lot of little techniques that these guys have been doing in Hollywood for many years now."***
>
> Brian Rubin, Infinity Ward

"We are bringing into gaming a lot of little techniques and things that these guys have been doing in Hollywood for many years now."

As Infinity Ward's HR department sought out the required talent to replace the ones it lost, the creative team has been busy building an all-new *Call of Duty* engine, built with the next generation of consoles in mind.

Last month Infinity Ward finally revealed its new engine in *Call of Duty: Ghosts* – the first project that it is handling on its own since the studio nearly collapsed in 2010. The new engine boasts a sharp rise in poly-count and ▶

DOGS OF WAR

A canine contributor to Call of Duty: Ghosts stikes a pose

WHEN INFINITY WARD brought together the team that would build *Call of Duty: Ghosts*, it wasn't entirely made up of human staff.

The rather strange images you see here, and on the cover, show one of the game's canine performers – curiously free of motion capture markers – posing in a photography studio during the development of the next title in the series. The role these hounds will play in the game? They serve as a four-legged accomplace, and were implemented with support from the real SAS.

Having recruited from Hollywood's pool of cinematic artists, Infinity Ward's Call of Duty: Ghosts, seen in concept form above, is conceived to be a particularly distinct addition to the series

the 60 frames per second that we've become accustomed to with *Call of Duty*.

But the most impressive new addition has been the inclusion of SubD, a subdivision surface technology that was built by Hollywood giant Pixar (*see panel, opposite*). This has a significant impact on how *Call of Duty: Ghosts* looks, helping to create smoother curves and surfaces, as well as 3D rendering to create realistic looking rocks, weapons and more.

"SubD is something Pixar developed, and Hollywood has been using it for years for feature film," says Rubin.

"Those guys have been using it in the pre-rendered sense, so it's not real-time. But we developed it and brought it into the game so it is working in real-time. It has a pretty material effect on the way the game looks, and that's the benefit of bringing these things in."

MOVING ON

From Infinity Ward's perspective, the next generation hardware is not so much about gameplay innovation, but the opportunity to create the most realistic *Call of Duty* so far.

"From a gameplay standpoint, we never felt hindered by the generation, or the consoles or the tech. We always felt gameplay isn't tech-dependant necessarily. Look at iPads and iPhones as an example of low-tech driving great gameplay," says Rubin.

"But this new tech allows us to make those worlds more realistic.

"As a player there's a barrier between you and the game. And that barrier is made up of a lot of different things; some of it is the controls, some of it is the gameplay experience. Some of that is the look of the graphics and what you're seeing on-screen in terms of text. But we can make that barrier thinner. 60 frames per second makes the barrier thinner. Less than 60 and that barrier becomes greater because now there is this gap between my actions and what I see on the screen.

> ***"We could have done something else. But we wanted to make Call of Duty and we wanted to create a new universe."***
>
> Mark Rubin, Infinity Ward

"It's the same thing with the latency of the controls. The lower the latency of the controls, the faster things happen, the barrier becomes thinner.

"It depends on the type of game, but for our game, if we were in the middle of single-player, pop up a message that went 'You've levelled up. You've unlocked a new fireball spell. Equip it now.' you would be pulled out of the game. If we did that, that would add to the barrier between you and the game. So we don't. We try to make it so the player always feels naturally involved in the world around them.

"Further to that, there's the artistic detail that we put into the environment. The more realistic and natural it feels to you, the more the player's imagination melds with that game, then the barrier gets even thinner."

INFINITE OPPORTUNITIES

During the reveal of *Call of Duty: Ghosts*, Infinity Ward certainly didn't come across as a studio weakened by the 2010 exodus.

The development outfit insists it is still very much in control of its destiny and its games. It was the studio that made the decision to leave the *Modern Warfare* brand behind. In fact, it didn't even have to make a *Call of Duty* game at all.

"We could have done something else. But we wanted to make *Call of Duty* and we wanted to create a new universe," says Rubin.

And the developer is also taking charge of the *Ghosts* marketing campaign, just like it did for *Modern Warfare*.

"I approve every screen, or should I say disapprove every screenshot," says Rubin. "You know the *Call of Duty: Ghosts* branding skull? We designed that in the studio."

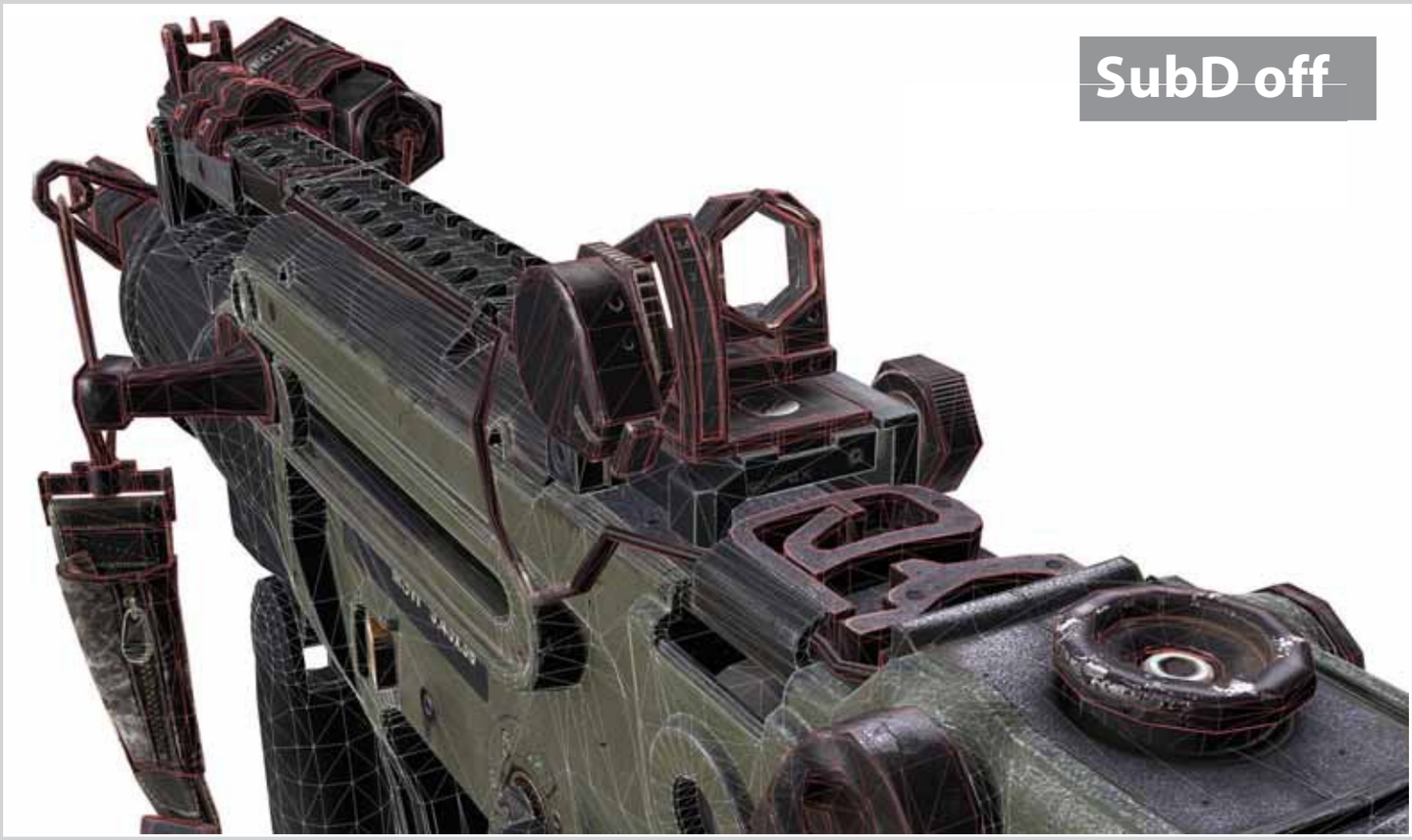
It all sounds promising. Infinity Ward may have been a difficult developer for its publisher to deal with, but its track record was flawless. And it demanded the highest of standards from everyone who worked at or for the studio.

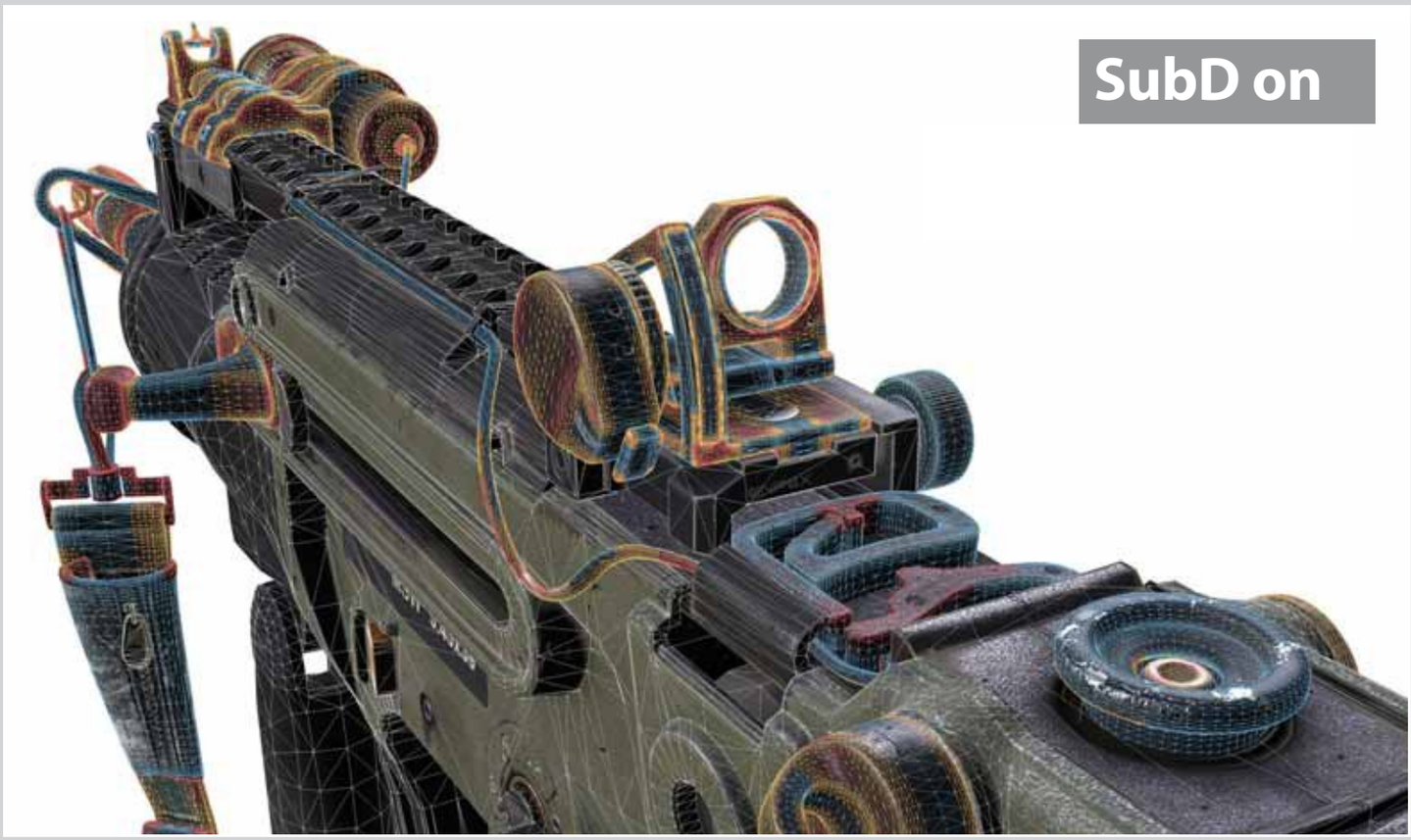
That high standard, combined with its new Hollywood talent and technology, bodes well for the upcoming *Call of Duty: Ghosts*.

And if the game and its technology lives up to its potential, then perhaps Infinity Ward will re-establish itself, not just as another great games developer, but this industry's answer to a Pixar or Lucasfilm. ■

WHAT DOES SUBD MEAN FOR CALL OF DUTY?

OF ALL THE technical muscles powering the new *Call of Duty: Ghosts*, it is SubD that underlines next-gen's ability to add subtlety. The subdivision surface technology, developed by animated movie giant Pixar, has been adopted by Infinity Ward, adapted to run in real-time, and, as is apparent in the two comparison shots on this page, makes a key difference to the smoothness of surfaces as they appear in 3D scenes. We admit, the below doesn't quite trump the magical world's Pixar spins with SubD, but smooth surfaces on generic guns in muted colours are likely to be ever so popular, we're sure. And they are really smooth.





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DEVELOP DIARY

Your complete games development event calendar for the months ahead

DEVELOP CONFERENCE
July 9th to July 11th
Brighton, UK
www.developconference.com

IT'S BACK TO the seaside for the eighth edition of the esteemed Develop Conference.

Expect the *Develop* team to bring you breaking news from the many sessions, chatter from the expo floor and exclusive interviews.

The second day also plays host to this year's Develop Awards, where hundreds of industry figures will be cheering on their peers and celebrating with the kind of gusto only the games industry has.

See you in Brighton.

JUNE 2013

E-VIRTUOSES
June 4th to 5th
Valenciennes, France
www.e-virtuoses.net

E3 EXPO 2013
June 11th to 13th
Los Angeles, USA
www.e3expo.com

GAMES FOR CHANGE FESTIVAL 2013
June 17th to 19th
New York, USA
gamesforchange.org/festival2013

WEB GAME CONFERENCE 2013
June 19th to 20th
Paris, France
www.webgameconf.eu

BRAINS EDEN 2013
June 28th to July 1st
Cambridge, UK
www.creativefront.org

JULY 2013

DEVELOP CONFERENCE 2013
July 9th to 11th
Brighton, UK
www.developconference.com

DEVELOP AWARDS 2013
July 10th
Brighton, UK
www.developawards.com

SIGGRAPH 2013
July 21st to 25th
Los Angeles, USA
s2013.siggraph.org

CHINAJOY 2013
July 25th to 28th
Shanghai, China
en.chinajoy.net

CASUAL CONNECT USA 2013
July 30th to August 1st
San Francisco, USA
usa.casualconnect.org

AUGUST 2013

DARE PROTOPLAY 2013
August 8th
Dundee, UK
www.dareprotoplay.com

GDC EUROPE 2013
August 19th to 21st
Cologne, Germany
www.gdceurope.com

SERIOUS PLAY CONFERENCE 2013
August 20th to 22nd
Redmond, USA
www.seriousplayconference.com

SEPTEMBER 2013

TOKYO GAME SHOW 2013
September 19th to 22nd
Tokyo, Japan
tgs.cesa.or.jp/english

THE MONTH AHEAD

A look at what June has in store for the industry and beyond

JUNE 4TH
e-virtuoses 2013.
This conference on serious games returns to the continent for its fifth event.

JUNE 14TH
Animal Crossing: New Leaf.
The village management game hits 3DS, and brings with it new objects to use and modify.

JUNE 17TH
Games for Change 2013.
Celebrating its tenth anniversary, this New York event explores the social impact of games.

JUNE 25TH
Company of Heroes 2.
Saved from limbo by Sega, Relic's anticipated follow-up to its wartime RTS arrives.

JUNE 7TH
Remember Me.
Will this stealth action adventure and its female lead, Nilin, put Dontnod on the map?

JUNE 14TH
The Last of Us.
Help Joel and Ellie survive a post-apocalyptic world in Naughty Dog's latest PS3 title.

JUNE 21ST
World War Z
Brad Pitt and zombies. Based on the book by Max Brooks. Don't abandon hope just yet.

JUNE 26TH
Shadowrun Returns.
Jordan Weisman's cyberpunk fantasy series reappears in this RPG for PC, Mac and tablets.

JUNE 11TH
E3 2013.
The gaming world's biggest trade show returns as Sony, Microsoft and Ninty square up.

JUNE 14TH
World Blood Donor Day.
If hospitals had a pint of blood for every mindless... on second thoughts, just check yourself in.

JUNE 21ST
World Music Day.
Let the music take you on this day celebrating the delights it brings. Listen to something new.

JUNE 28TH
Brains Eden 2013.
Cambridge's fifth gaming festival features career clinics, game jams and dev talks.

To find out more about Deep Silver's publishing, marketing and promotional services, go to **www.deepsilver.com**

Event spotlight: **Brains Eden**

Will Freeman on what the Cambridge development hub gains from its annual industry conference for new talent

IT'S LITTLE SURPRISE that the UK's academic stronghold in Cambridge is also home to a bristling games development hub.

The city's two universities – Anglia Ruskin and Cambridge – have fostered a significant local technology sector with a substantial global standing, and as a result a wealth of studios from indies through to giants like Jagex have made a home there.

One of the bodies representing the games makers gathered around the Cambridge hub is development network Games Eden, which, together with Anglia Ruskin's own Creative Front incubation and growth initiative, produces the Brains Eden Gaming Festival.

Brains Eden itself brings together a symposium – which this year will see a keynote from Eidos life president Ian Livingstone and a live BAFTA Question Time Panel – a game jam, careers clinic and even a games artwork exhibition. It's an ambitious mix, and one designed to help both local games companies and students from across the globe.

WORKING AS ONE

"Creative Front has worked with Cambridgeshire's creative industries over the past two years to fully understand the skills and attributes employers are looking for," says Creative Front manager Clare Denham. "Our mission is to help grow and develop the talent of the future. In an effort to retain and attract the very best talent to Cambridge, Creative Front is launching new services through **www.creativefront.org** to give graduates invaluable advice on creative careers, industry insights and access to paid internship opportunities. This is made possible by an EU initiative called VIVID [Found at **www.vivideurope.net**]".

With Livingstone set to share the secrets of his success, and the BAFTA panel bringing together locals David Braben of Frontier Developments, Mark Gerhard from Jagex, indie superstar Terry Cavanagh, ARM's Nizar Romdhane and Mark Green from Sony Guerrilla Cambridge, Brains Eden will be invaluable to student developers that attend the show.

> ***"It's all very well going out and recruiting seasoned industry veterans, but we also need new blood, new talent."***
>
> Mark Green, Sony Guerrilla Cambridge

But it is of equal use to even the most established of studios, as Green reveals.

"It's all very well going out and recruiting seasoned industry veterans, but we also need new blood, new talent who have fresh ideas and no pre-conceptions about the way things should or shouldn't be," he says. "Brains Eden is a great place for us to meet hundreds of students and recent graduates with an eye to the future. Outside of Brains Eden we have strong relationships with a number of universities, but this event gives us access to so many more students who we wouldn't otherwise have met."

FIRST COME, ALL SERVED

And Green isn't the only SCEE staffer who sees that value. In fact, a relationship has been forged between the event and PlayStation First, which fosters the next generation of games developers through working with educational establishments and providing access to professional PlayStation development technology.

"PlayStation First works in partnership with Brains Eden and Sony Guerrilla Cambridge, in our common goal to raise awareness of video game career paths, and to energise the next generation of game developers to showcase their talent and skills to our studios," explains Maria Stukoff, head of academic development at SCEE.

And, adds Green, Brains Eden also serves academic bodies looking to better serve the games industry.

"Right from the first Brains Eden five years ago we've encouraged the universities to send their lecturers as well, and a combination of them getting close access to so many industry professionals, meeting with other academics from this country and across Europe – and I think most importantly – seeing how their students get on in the game jam can really demonstrate what they're doing better than other institutions, where they're falling behind the leading schools and, of course, finding out what is and isn't actually of interest to industry," he says.

Combined with the Careers Clinic, which offers students and graduates a rare opportunity for to talk directly to games development studios and future employers, and the creative exercise that is the game jam, it all adds up to an essential event.

Brains Eden 2013 takes place at Anglia Ruskin University in Cambridge from Friday, June 28th to Monday, July 1st.
For more information visit **www.creativefront.org/brainseden**. ■

Top-to-bottom: Clare Denham of Creative Front, Maria Stukoff of SCEE and Mark Green of Sony Guerrilla Cambridge

THE DEVELOP QUIZ

The scores are now in for the most recent Develop Quiz, which took place in May, meaning it is time to run down the results from the industry's tri-annual knowledge clash and see who went home with the hard-fought for trophy

The Develop Quiz May 2013 victors Firefly Studios

JUST BEFORE THIS magazine went to press, some of the UK development scene's sharpest minds came together to do battle at the tri-annual Develop Quiz.

By the end of the night, indie developer Firefly Studios had emerged as victorious.

An extremely close finish saw Firefly secure 61 points, with Bossa Studios' first of two teams taking second place with 60 points, and The Creative Assembly close behind with 59 points.

Teams battled it out over topics including 'Swedish Band or Ikea Furniture?', 'Video Games Toilets', 'Console Cartridge Close-Ups, 'Pixelated Sports Stars' and 'Kids' TV Themes'.

Thanks to all the teams, and the quiz's headline sponsor Microsoft and round-sponsor UKIE for making the ever-popular night yet another success.

As well as the main quiz prizes, Bossa's Henrique Olifiers took home a Nokia Lumia 800 phone, donated by Microsoft and given out after a blind draw.

The next Develop Quiz will take place on September 18th. If you want to join in on the fun, book now and contact **Kathryn.Humphrey@intentmedia.co.uk** to avoid disappointment.

THE SCORES

Want to know the results of the recent Develop Quiz? Here they are in full

Headline Sponsor Microsoft

Round Sponsor ukie

1.	**WINNERS:** FIREFLY STUDIOS	61
2.	BOSSA STUDIOS 1	60
3.	THE CREATIVE ASSEMBLY	59
4.	BOSSA STUDIOS 2	54
5.	FUTURE GAMES OF LONDON	52
6.	SIDE	51
6.	MICROSOFT 2	51
6.	DEAD GOOD MEDIA	51
9.	MICROSOFT 1	50
9.	BIG HEAD GAMES	50
11.	UKIE	48
11.	FIRST TOUCH GAMES	48
13.	DATASCOPE	46
14.	PLAYMOB	41
15.	CREATIVE PERSONNEL	35

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//COMMENT: BUSINESS

Does aggressive monetisation work?

Nick Gibson considers the financial reality of gaming's bolder business models

Aeria Games' MMO Shaiya (above), is unabashed about its microtransaction strategy, but Gibson argues there is a place for this kind of business

THIS MONTH, I want to talk about a subject that many developers find deeply uncomfortable: the use of aggressive monetisation strategies, and in particular those involving microtransactions.

As this is a business column, I am not going to talk about the undoubtedly valid ethical debate around this issue, but instead use facts and experiences gleaned directly from developers to investigate whether more aggressive monetisation tactics actually work commercially, or whether they simply drive players away and are unsustainable in the long-term.

Whenever we talk to developers experienced in the deployment of sophisticated microtransaction models, we repeatedly hear that every games community has a vocal minority that will object to any implementation of alternative monetisation techniques. They often give the impression that they speak for the majority of a player base. In practice, they never do. Most player bases are highly fluid with the majority of users seemingly indifferent to even some of the most egregious of commercial model tactics.

MONETISATION HEROES?

One of the most illuminating examples of this was *Battlefield Heroes*, when EA decided to start selling gameplay advantage not only long after it had launched and had some three million registered users, but also after it had expressly promised it would not do so. Predictably, the announcement triggered an eruption of online rage, petitions, boycotts and predictions of the game's quick demise.

What actually happened was surprising. Both churn and new registrations remained unaffected while pay conversion rates and revenues leapt upwards as soon as the switch was made. Since then, the game has more than tripled its registered user base. Even the vocal minority failed to follow up on their threats and, ironically, became among the game's biggest spenders.

SW: TOR is another example. Its transition to what was seen as a particularly aggressive freemium microtransaction/subscription hybrid model with heavy restrictions on free play was again accompanied by a fervid and clamorous outcry and similar predictions of doom. However, BioWare recently revealed that the player base has actually blossomed since the switch, and its subscriber base has grown back to half-a-million. The adoption of this 'unpopular' model not only rescued a dying game, but has also resulted in monthly revenues doubling from its pre-switch levels.

But how far can developers go with their models? Based on what I have seen, it is likely to be far further than most developers think.

To illustrate this I would like to turn to one of the biggest Western games studios you have probably never heard of, Aeria Games.

Aeria Games is a 600-person US-headquartered MMO publisher specialising in bringing Asian MMOs to the West. What makes Aeria relevant to this discussion is the sophistication and expansiveness of a microtransaction monetisation strategy that has a particular focus on chance, artificial scarcity and selling gameplay advantage. Aeria deeply ties this monetisation into gameplay for example with game modes that feature character perma-death that is only reversible with hard currency-bought resurrection potions. Most of its games are overtly and unabashedly pay-to-win and some of its in-game items can cost upwards of $150 in hard currency.

BUCKING CONVENTION

Conventional industry wisdom would suggest that these techniques are unsustainable in anything other than the short term, preventing any long-term player loyalty and erecting major barriers to new players. The truth is far from this. Its leading title, *Shaiya*, a PvP MMO in which a pay to win arms race is actively engendered, has an ARPPU of $130-$150 per month and contributes significantly to Aeria's annual revenues in the West of over $150 million.

Even more counter-intuitively, *Shaiya* was launched seven years ago, around a fifth of its players have been active since 2009 and its revenues are still growing, proving that even its extreme pay-to-win monetisation techniques can be sustained in the long-term. Aeria's games certainly have their detractors but, as with other games, their vocal indignation appears to have no material sway over the majority of players.

It is difficult to escape the fact that numerous freemium developers have failed because they employed overly conservative or tentative models, while almost all of the top grossing freemium developers have flourished using pay-to-win and other comparatively aggressive monetisation strategies. This does not mean that great commercial success cannot be achieved.

However, there are plenty of game types for which these models are suitable and I would simply urge developers to overcome their discomfort, look beyond the vocal minority and investigate the commercial practices of the top grossing developers. ■

Nick Gibson is a director at Games Investor Consulting, providing research, strategy consulting and corporate finance services to the games, media and finance industries. **www.gamesinvestor.com**

//COMMENT: WOMEN

Too many reasons why

Sophia George looks at the numerous potential gains 'games for girls' could bring

RECENTLY IN THE games press we have seen a huge focus on gender in games, from Anita Sarkeesian's Tropes vs Women in Video Games project to #1reasonwhy.

Yet, according to the 2012 *Develop* Salary Survey, 94 per cent of game creators are male. This is a huge problem, as women's voices and life experiences are not being heard.

I think it's great that the games industry is today perceiving the lack of women developers as a failing. We are seeing organisations start coding clubs and games design workshops aimed at girls, and efforts to get more women in the industry into the media, to act as role models for young girls. However, I think that we are overlooking a big problem – we need to make more compelling games for women and girls to enjoy, so that they can be inspired to work in this amazing and highly creative industry.

GAME GIRL

I am at a very early stage in my career at the moment, but I have always taken an interest in games 'for girls', probably due to often being dissatisfied with games growing up. Why do we rarely see games tailored for women and girls, as we do with other media? It's one of my goals as a designer to make sure my games appeal to an audience that is often sought – but seldom acknowledged – in gaming culture.

Throughout the history of games, there have been several attempts at having gender-specific games, or games made and marketed primarily towards girls. In 1996, PC game *Barbie Fashion Designer* shifted over 500,000 copies, outselling titles like *Quake*, establishing the 'Girls' Game Movement', also known as 'Pink Games'. This movement was not only to expand the games market, but to also introduce girls to games, so that they may take an interest in computers, engineering and technology, and pursue careers.

Meanwhile, Brenda Laurel founded Purple Moon to make games for young females, spending two years researching how to make games that girls would like, publishing the team's findings in the book *From Barbie to Mortal Kombat*. The research suggested that girls prefer gameplay activities such as creating, collecting and constructing, and preferred emphasis on story, characters and relationships, rather than goal-based gameplay.

> ***I would love to see lots of women playing titles that go beyond match-three puzzle games, and moving onto games that have rich narratives.***

Prior to the Girls' Game Movement in Western countries, Japan had also explored the possibility of making games for girls, focusing on themes of social interaction. Japan's 'Women's games' enjoyed much more success than their Western counterparts, and are still popular today. Unlike the Girls' Game Movement, Japan's games for women were not created from a feminist standpoint, but a commercial one.

Japanese studio Ruby Party is an outfit created by taking female staff from Koei game teams, and getting them to make games that would interest them personally.

Angelique, released in 1994, was Ruby Party's first game, and is very important in regards to gender-specific games. It was the first of its kind and set many features current in many of Japan's Women's games. The gameplay is a mixture of conversation and city-building, with a narrative inspired by girl's manga. By basing the game on conventions of a pre-existing and very popular medium, the developers successfully familiarised girls with digital games, and even managed to appeal to adult women. The game was vastly successful, prompting sequels, comics, animations, novels, live events and merchandise. Since then, Ruby Party has created many successful games for women and girls, and has prompted other companies, such as Konami, to do the same.

ON THE MONEY

Comparing the Girls' Game Movement with Japan's Women's Games is interesting. Firstly, it is important to note that, unlike in the West, Japan's Women's Games were not motivated by political and educational motives. Instead, they were predominantly capitalist in their conception. And they are still an ever-growing niche, whereas the Pink Games had a rapid decrease in popularity after a few years, and now effectively cease to exist.

These days, women make up to half of the gaming population. Yet, I still think that there is a gap in the software quality. For me, I would love to see lots of women playing titles that go beyond match-three puzzle games, and moving onto games that have rich narratives, appealing graphics and complex mechanics. Of course there are many women who enjoy current core titles – myself included – but I feel we need to create a wide range of games to cater to everyone, with characters that are diverse and interesting. ■

Sophia George is chair and creative director of Swallowtail Games, based in Dundee, Scotland, and winner of the 2012 BAFTA Ones to Watch Award. She is currently making *Tick Tock Toys*.
www.swallowtailgames.com

//EXTRA CONTENT ONLINE

"Stories are circulating about Nintendo demanding the ad earnings of Let's Play videos of their games. I wanted to write this piece to try and convince you how wrong they are, and hope, vocally, that no indie takes this approach to heart."

Mike Bithell, Indie developer

"One of the major challenges in such a situation is finding good talent to join your team, and we have observed this issue manifesting itself mostly in programming roles. However, this is not due to a lack of programming skills."

Stephen Caruana, Pixel Software

"The further along my games development career I get, the more I realise just how much games have to offer the world of architecture, and what architecture and architects have to offer the world of games development."

Nicholas Lister, Indie developer

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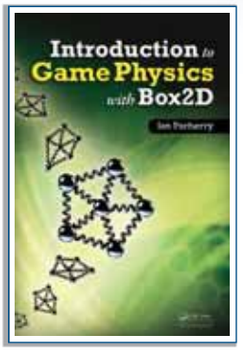

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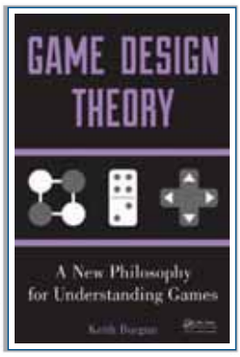

Keith Burgun
Dinofarm Games, Goldens Bridge, New York, USA

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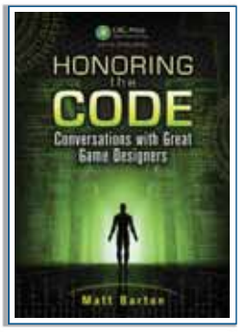

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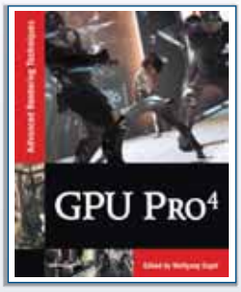

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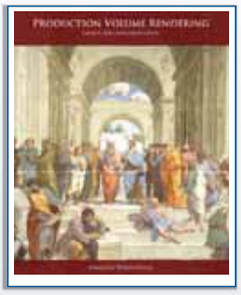

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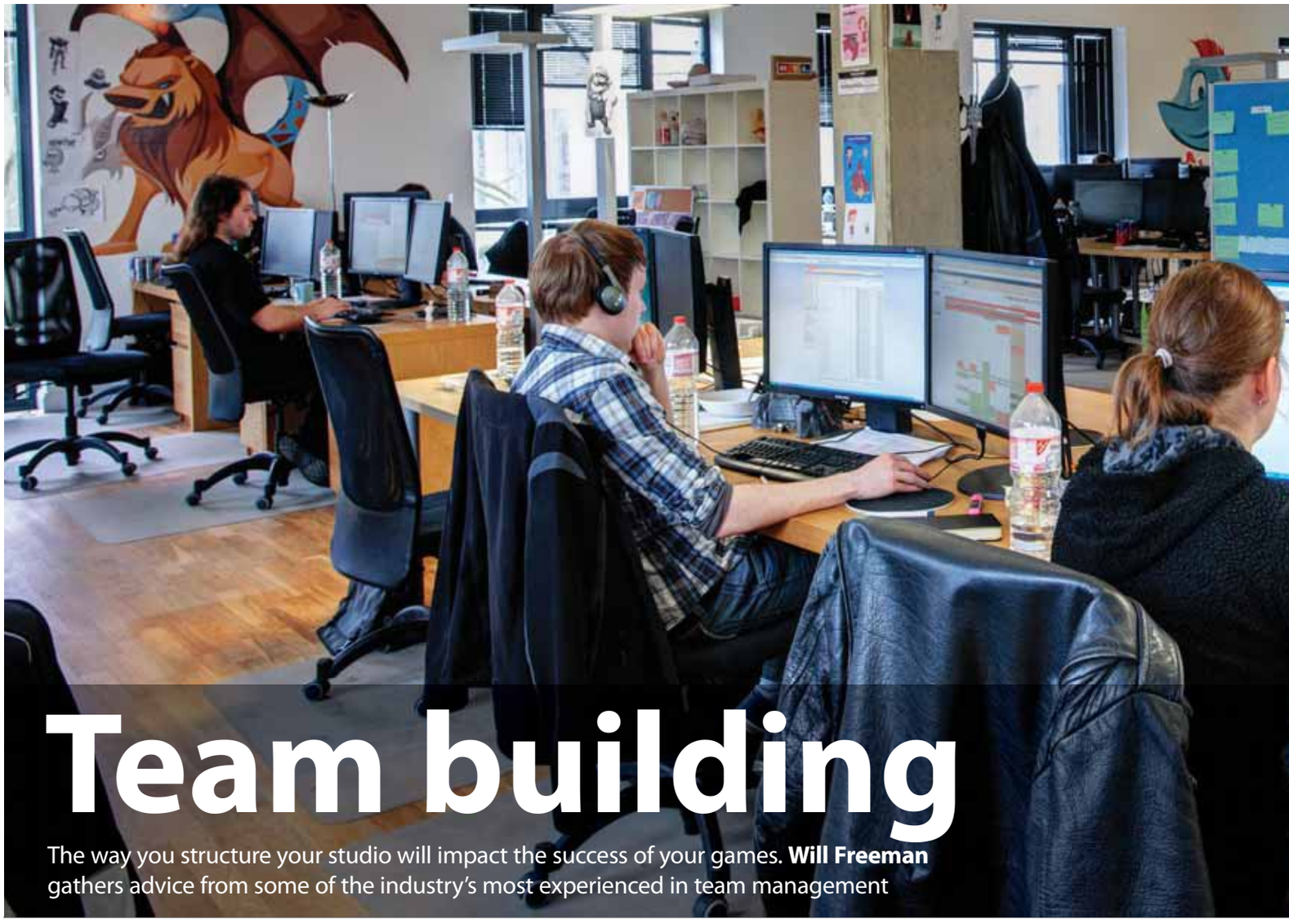

Team building

The way you structure your studio will impact the success of your games. **Will Freeman** gathers advice from some of the industry's most experienced in team management

Main image: Goodgame Studios in Hamburg, which operates around a flexible management structure

FEW YOUNGSTERS WHO consider a future career in games development likely look forward to tackling the challenge of structuring a studio.

With all those visuals, narratives and gameplay mechanics to ponder, it's easy to forget about management structures, workflows and human resources.

But that isn't just true of teenage dreamers planning employment in the word of making games. For new studios, creatively focused teams and even industry veterans, it can be all to easy to turn a blind eye to the way a team is structured; a grave mistake when you consider the impact on end product.

Speak to numerous established team managers, MDs, CEOs and HR specialists and you'll hear it time and again; better management means better games. And nothing, surely, is more important than the quality of your final product, however you define that quality.

"Your management structure has two main areas of effect on product; how effective we are at producing a game that meets expectation, and how happy the team is whilst working on the game," says Stainless Games production director Ben Gunstone of the importance of developing the right company organisation. "The end result is that our studio management and structure helps to ensure that quality games are produced that meet expectations and the team enjoy working on them."

Put like that, it sounds ever so simple. The well-managed team makes good games well. But building a team, employing the right people, choosing a hierarchical model and implementing the best HR process isn't so easy, as there is much to consider.

> ***"It's been a challenge to become more rigorous and business-savvy without undermining our independent spirit."***
>
> Phil Mansell, Jagex

"A studio's management structure does a lot to shape its culture and priorities," says Phil Mansell, executive producer on RuneScape for the ever-expanding UK developer Jagex. "It comes down to decision-making. Firstly, who makes the calls for what decisions? Is the studio product, finance or marketing-led? Does the development culture favour technical, design, artistic or scheduling above the others?

"Secondly, what is the process? Do decisions come from just a few individuals, is it diffuse and consensus-driven, or is it delegated down through reporting lines?"

There's clearly much to deliberate over, and it's a process that can't be rushed, as these tendencies within a team will steer decisions throughout development cycles, and infuse themselves throughout all layers of management and creative direction.

FLEXIBLE THINKING

And one of the key decisions when committing to a management structure is about flexibility. Is it best to conceive an approach to how you position your team and stick to it, or remain free to change and adapt?

"Flexibility has been in Goodgame Studios' DNA right from its founding in 2009," offers Olliver Heins, head of games at prolific German indie outfit Goodgame. "That enables us to adapt to change instead of having to rebuild everything from scratch. We can easily expand the existing organisational structure and management model for new departments – for example, for mobile development or new international markets, or for new requirements concerning time frames or technical demands."

Goodgames approach is an entirely logical one, and shared almost universally. Being flexible as a company is today core to any games studio, especially in a market evolving with the veracity of the development sector. Trends come and go, business models change, and audiences diversify almost weekly, so remaining adaptable is vital.

"Each change [in the industry] has to be dealt with and there are multiple changes going on," confirms Mike Simpson, studio director at Sega-owned studio The Creative Assembly. "The requirement to finish major projects that used to take four years in 18 months has been dealt with by team size, structure and process changes. The move towards games as a service means working on multiple threads in parallel as the team continues to support all its past efforts rather than kissing them goodbye on release day."

Similarly, the need for regular updates for online games means breaking traditional publisher departmental splits between development, marketing, sales, QA and IT and creating new cross-discipline live operations teams that are nimble enough to handle bi-weekly updates.

"These changes are all great for developers," continues an optimistic Simpson. "They give individuals more opportunities to use their talents effectively and creatively, and to have a real impact on the end result. It's a new golden age for games development."

SERVICING NEEDS

"Running a game as a service has meant we've experienced a different type of turbulence compared to traditional development studios," continues Jagex's Mansell. "Rather than new genres and distribution channels, we've had to adapt to greater market competition, evolving business models and a broader player base."

For instance, as the demands on Jagex's teams have grown and subsequent scheduling has become more complex, the team has needed to strengthen its production methods, both through dedicated project managers and via more powerful scheduling systems.

"We've also needed to become more commercially focused and have brought on specialist staff for monetisation and analytics," adds Mansell. "It's been a challenge to become more rigorous and business-savvy without undermining our independent spirit, but we've found a pretty good balance so far,"

The Creative Assembly, Jagex and Goodgame certainly aren't alone in finding they need to keep flexing their team make-up and management systems to keep apace with industry trends, but, according to some, there simultaneously remains a need for consistency, even in these dynamic times.

Stainless Games' Gunstone is part of what he calls a "relatively static" team, and with good reason; namely leadership. Even the flattest teams (more on that later) need a degree of hierarchal control, lest they loose structure altogether and fall foul of many of the trappings of letting creativity prosper without control.

"It's important that we have leads in place for any project: lead programmer, artist and ▶

MANAGING MISTAKES

A trio of experts detail common management shortcomings, and how best to avoid them

"I believe having a structure that is too rigid or based too heavily on theory can be disastrous. In our case, we tried to compensate for our rapid growth from a small, inexperienced studio by applying a rigid structure based on theory of project management methodologies and the like. While that is as good a place to start as any when you don't know what you're doing, I believe you need to be very open to adapting your structure as you go along"

Peter Lübeck
Studio Director, Tarsier Studios

"Studio structuring can become too much of a format. Creating structures and systems is good to avoid reinventing the wheel time and time again, but there needs to be a balance with continuously asking if the framework or structure in place is fit for purpose. Leaders in our business need to work with an open playing field. It's a very different set of skills working with a preset way of doing things to creating the way we do things."

Phil Mansell
Executive Producer, Jagex

"Common mistakes come from either too little or too much direction from the top levels. It can be just as disastrous to provide too little direction – presuming everyone knows what they are doing – or too much – presuming no one knows what they are doing. We also hear lots of stories of development teams expanding massively and too quickly and this can lead to an existing company culture dissolving."

Ben Gunstone
Production Director, Stainless Games

Top-to-bottom: Emma-Jayne Cole of The Creative Assembly and Hendrik Mainka and Olliver Heins of Goodgame Studios, whose team can also be seen in the photo above

designer, supported by a producer," asserts Gunstone. "On a smaller team this does mean we wouldn't have many other people on the team, but leads are vital to ensuring product vision, both technically, artistically and design-wise are adhered to and driven by people who are able to see a bigger picture."

However, it remains the case that budgets, production pipelines and project timescales are changing, and thus a studio management method that supports these trends is increasingly popular.

One approach is in adopting contracts that favour the short term, as Nathan Adcock, PR and marketing manager at games industry recruiter OPM Recruitment, has seen with increased potency.

"We have noticed a lot more studios are hiring people for short contracts," he says. "If a studio is working on a project that will only take six months, they only need some people for those six months. It makes a lot more sense to get someone in for a short time rather than trying to find work for them once that project is over."

TINY TOWERS?

Similar to the questions around balancing regularity and fluidity of management approach is the topic of the depth of the structure you adopt. While outside the games industry hierarchical models prosper, where numerous neatly formed layers of management stack one atop the other, in this field it's much more common to find pancake-flat systems. In former issues of this magazine Irrational, Gearbox, Valve, Blitz and even tools companies like Autodesk and Havok have espoused the benefits of flat management, which is often presented as a creatively democratic plane where anybody from CEO to receptionist can have their ideas listened to.

> ***"It makes a lot more sense to get someone in for a short time rather than trying to find work for them once that project is over."***
>
> Nathan Adcock, OPM

"We highly value our employees because we know we wouldn't be as successful as we are without these gifted people. We entrust everybody with autonomy and responsibility, everyone is able to make a difference here from day one. We think of ourselves as one team, not in terms of status, and try to establish an atmosphere of learning from one another and inspiring each other," says Goodgame Studios' head of human resources Hendrik Mainka of democratic management models. "This approach works very well for us and enables us to offer a great work-life balance with regular working hours and almost no crunch times at all."

It's a sentiment you'll here echoed throughout the industry, with indies and triple-As alike devoting their staff to flat structures. But there are alternatives, and many insist there is a place for some hierarchy.

"We use a hybrid approach which uses a fairly hierarchical model for resource management but a decoupled and flatter approach for creative decision making," states Jagex's head of HR Laura Hare. "It's important to use to have strong team structures and reporting lines, but also having a more open approach for creative matters. I think either can be made to work, as long as hierarchy and process aren't stifling and don't get in the way of communication, feedback and flow of ideas."

Elsewhere, there are those who implement even less traditional management systems that studios still considering how they might build their team may do well to contemplate as an alternative to convention.

"As a Swedish game studio, we represent something that is quite different from, say, US studios," states Peter Lübeck, studio director at Malmö's *LittleBigPlanet PS Vita* developer Tarsier. "At least that is what people tell us. Our culture is generally more open, transparent and involving, and even though we often apply seemingly similar management structures, the end result is often quite different."

The idea is that people are more involved in the development process and can question anything and anyone at any time, without risking harsh reprimands. There is none of what Lübeck describes as "management by fear", and while Tarsier does implement a hierarchy, there is less aggressive policing of

decision making compared to other at Western studios.

"We give people room to shine, grow and criticise, and we seldom make decisions without having given people the opportunity to speak their mind," continues the studio director, before adding an encouragingly frank detail. "There is a downside of this as well, in that we sometimes don't act on things quickly enough. There are obvious benefits of strong, top-down decision making, but that's not really us. We're trying to find a sweet spot. I will let you know when we find it."

PEOPLE POWERED

Whatever the management approach a games studio adopts, it is, of course, only a matter of organising people. What is arguably far more important is the way you treat those people, and that is the role of human resources. Human resources – or HR – is technically a rather cold term for your workforce, but today really describes the discipline of HR, which is about recruiting staff, introducing them to their role, and keeping them happy. And it's an essential art for any modern studio, whether you actually have a member of staff on your team with HR in their title or not.

And it is Goodgame Studios' Mainka that offers *Develop* an description of its HR approach typical of many studios.

"We highly value our employees because we know we wouldn't be as successful as we are without these gifted people," says the head of HR. "We entrust everybody with autonomy and responsibility, everyone is able to make a difference here from day one. We think of ourselves as one team, not in terms of status, and try to establish an atmosphere of learning from one another and inspiring each other."

That approach, insists Mainka, works very well for Goodgame Studios and enables the senior team to offer a great work-life balance with regular working hours and that ever-desirable complete lack of crunch times.

> ***"Responsibilities that the management team has in a larger studio still need to be handled by someone in a small studio."***
>
> Peter Lübeck, Tarsier Studios

And, says OPM's Adcock, it is a games developers HR approach that is paramount in a studio attracting the right fresh talent. As much as supporting the staff with the right benefits, and HR team must also be the front of house for recruitment.

"Regarding HR, it is very important [in attracting staff]," claims Adcock. "The HR team are often the first or initial contact candidates have with studios, so their demeanour and approach is vital in making a good first impression, being able to represent the company to its best advantage and influencing candidates who are also interviewing elsewhere."

While most large-scale teams have either an individual or an entire division devoted to human resources, today many small or medium-sized developers find themselves assigning such duties to a member of staff embracing several roles, or employing their first HR specialist. For them, understanding the role and its nuances is essential.

"From an HR perspective you should always be there to support the development of the game as a whole and take barriers away rather than impose them for the sake of process," suggests The Creative Assembly's recruitment and HR assistant Emma-Jayne Cole, who points out that historically, HR has been seen as the work of a person tucked away in a corner processing payroll, filling in forms and welcoming new starters.

"Successful HR is far more than that when you can work in a truly innovative and integrated way with every part of the business," she continues. "As a result, the studio will thrive and employees will feel contented. So in essence, keeping games developers happy lies in the simplicity of giving them enough creative space and freedom to do what they do best and appreciating their efforts thereafter. A restricted creative person is a miserable creature indeed and in my opinion will be reflected in the quality of the game."

DIFFERENT SIZES, SAME ISSUES

Clearly then, human resources and studio management is a fine art. It's the subject of much business theory both inside and outside the industry, and a constant challenge to even the most colossal of teams. But that doesn't mean that carefully considered management methods aren't important to the likes of independents and small-scale operations. And, more significantly, it's perfectly reasonable that they can adopt much of the theory and practice of what senior staff at larger teams implement.

"Regardless of your studio size, many of the same things apply in one way or another," confirm's Tarsier's Lübeck. "All the responsibilities that the management team has in a larger studio still need to be handled by someone in a small studio."

According to the studio director, titles and hierarchy are perhaps not as relevant as some would assume, but ownership and responsibilities are. Your team may feel you not need an HR manager, but if you have any employees at all, someone must assume responsibility for any HR related duties and queries, such as recruitment, contracts, salaries, labour law issues and so on.

"It could be the same person who does the graphics programming and refills the coffee machine, as long as it is perfectly clear who it is, what the responsibilities and expectations are, and that that person has a clear mandate to act on those responsibilities," concludes Lübeck.

It's an encouraging note to end on, and one that highlights the fact that managing – while an acquired skill – is not as abstact as the likes of coding, and, with a little bit of thought and effort, can be perfected at any development studio. ■

Top-to-bottom: Laura Hare of Jagex, Mike Simpson of The Creative Assembly and Nathan Adcock of OPM Recruitment. Left: Jagex's dev team taking it easy

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Nimble tips

Supermassive's **Jonathan Amor** considers how the four pillars of the Agile methodology of games development can help a studio keep competitive edge in a changing market

THE GAMES INDUSTRY changes all the time, so we need to adapt rapidly as a business.

We have stuck to the core values of Agile beneath everything, because it provides us with a strong framework to keep projects on track in a fast-moving, creative and highly technical environment. Here are some examples of how we apply the four different pillars of Agile.

ONE: PEOPLE POWERED

Firstly, we value individuals and interactions over processes and tools. And we value them very highly, especially in terms of regular face-to-face communication. But, of course, we still also value tools and processes. When efficient and used correctly, they are vital to support our more collaborative, iterative approach. One cannot replace the other.

A lot of what we do in a project's early days is to iterate and discover the elusive 'fun factor' in a game. That's not a process you could build a tool or process to achieve. It can only be accomplished with iteration and collaboration. What works in theory can't be proven until you play the game. Harnessing individuals' passion for making games is essential; that's what motivates them. It's important that they know their great ideas could end up in the finished product.

Across the studio, we use Scrum and generally stick to its core tenets, with regular meetings to review progress, blockers and plans, but how much we use it varies according to the project and the stage it is at. It works particularly well in a project's middle stages when it is easier to define what the goals are. At the beginning of development so much is investigation and research that it can be hard to write specific, measurable goals, whereas in the latter stages the focus is more on addressing bug reports and making fixes. Every sub-team generally has its own task board and, at the very least, it provides a way to make progress visible daily.

Using effective version management means that we can be less concerned about trying something out, because if we make changes we won't lose the original version; we simply roll back if needed. It gives us the freedom to focus on creating code and assets to explore new ideas without having to worry about losing any valuable work. Perforce has always been very reliable. We just know that we can assume it is working and will scale to match whatever we require. By autumn 2012, our three Perforce servers were handling around three terabytes of data, or about 6.7 million files.

A feature we find very useful is Protection Groups, which, when coupled with well-managed Client Specs, gives people a solid framework for what they should be focusing on and prevents them from making accidental changes outside their remit. Also, they only need a subset of the whole project source, rather than synchronising everything, which can make a big difference in time and network traffic on a large project such as *Until Dawn*. For example, we might put all the audio team members on a project into one group and then limit the folders and files they can use to just the audio and other relevant project data.

TWO: MAKING SOFTWARE WORK

We also value working software over comprehensive documentation. Working software is massively important to us. We try to review the game very regularly – towards the end of the production process as often ▶

Giving team members access to only the relevant data has made the process of crating Until Dawn (above) smoother, says Jonathan Amor

Speaking to gamers directly helped Supermassive understand what they want from Wonderbook: Walking With Dinosaurs (above)

as once or even twice a day – so it's really important to get a build of the game easily and quickly. Again, tools are a complement to that: we have built a dedicated build server that is always integrating the latest data through Perforce, so we can create a build in just a few hours, often as little as half an hour. Ten or so years ago, it often took all night to create a build, despite having far less data.

Branching also helps us ensure we always have working software. We can branch the code and data – perhaps we want to try something different, or to prepare separate demo versions as we did for Gamescom in August 2012 – and then work on that in isolation, so that any changes will not affect the working mainline. This allows the bulk of the team to continue working as normal, whilst ensuring that changes in either branch won't cause bugs in the other.

THREE: WALKING WITH CUSTOMERS

Next, we value customer collaboration over contract negotiation. Our publishers are our paying customers, but customers can also be colleagues within the studio. On *Wonderbook: Walking With Dinosaurs* it became evident that we needed additional custom tools for our designers to create the interactions and sequences of events used on the *Wonderbook* page layouts.

We have found from experience that taking a brief, working with a rigid set of requirements, going away and building something in isolation, then coming back to the customer several months later doesn't work well in practice. We believe it is far better to sit down with the customer – in this case the tools programmer sitting with the designers on the project – for half a day or so and really understand the context of what is required. This more collaborative approach means that better solutions to problems can be suggested, and also gives a solid foundation for on-going communication during development. We avoid having a completely separate central tools team, as this can lead to a lack of communication and understanding of the problems the development teams face. Instead, we have a tools specialists group who are assigned to the teams as needed.

> ***"We believe it is far better to sit down with the customer for half a day and really understand the context of what is required."***

Of course, we also work closely with our publisher customers, particularly their producers and QA teams. While a lot of the work we do is agreed and planned well in advance, we try to foster as collaborative a relationship as possible, with regular face-to-face meetings.

One of our most essential systems supports the localisation of text strings and voice audio for a game. On Sony products, a centrally hosted database, which can be accessed by the translation teams and the development team, holds all the current assets. For an interactive drama game like *Until Dawn* this can be as much as 25,000 lines of dialogue.

From our side, we can then pull down new versions of the localised data into Perforce or push any script changes back up. The client's translators can take a drop of anything that has changed and put their translations back in the database. Previously this would have been a laborious, error-prone and manual process on a spreadsheet with notes about which text needed to be changed.

FOUR: PLANNING FOR CHANGE

Finally, we value responding to change over following a plan. But that does not mean that you do not need a plan. In fact we place a lot of importance on solid planning processes and have recently brought in dedicated production managers. However, within that framework it is still essential to be flexible, to be able to respond rapidly to change and make that attitude part of our ethos. While it's not always human nature to embrace change, it is a lot easier if teams know they have the supporting mechanisms, including dependable version management.

The games industry is going through an unprecedented period of change, with games available on an increasingly wide range of devices, as well as the growth of casual games and more complex games, meaning that the 'middle market' is tougher than ever. That is why we are focused on building a reputation for high quality games, which requires a studio where people can do their best work all the time, and we believe that working in an Agile way will continue to help us to achieve that. ■

Jonathan Amor is director of technology at Supermassive, which employs over 100 people. Founded in 2008, the studio is working on *Until Dawn* and *Wonderbook: Walking With Dinosaurs*.
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Why Berlin is never Berlin

Germany's capital city is in a constant state of flux. The result is a creative hotspot where games development thrives. **Will Freeman** investigates the reality of the industry in the economic powerhouse

Top-to-bottom: Johannes Rolf of HitFox and Kai Bolik of GameDuell

"PARIS IS ALWAYS Paris, and Berlin is never Berlin," so said former French culture minister Jack Lang in 2001, referring to how rapidly Berlin changes.

Today, the case remains the same, in that everything is different. The idea is that as soon as any attempt to summarise what defines Berlin has been orated or written, the city has already moved on.

The home to 3.5 million does have consistent elements; it has long stood as an economic stronghold, famed for its cultural diversity and youthful atmosphere. But its games industry figureheads are certain its dynamic state is the city's greatest forte.

"Berlin is changing on an almost-daily basis as it tries to catch up and rebuild its image as a world-class cosmopolitan city, with two halves rejoined," offers Dr Pascal Zuta, CEO of the European wing of MMO publisher Aeria Games. "Part of this change includes encouraging growth of industry here. Berlin has come a long way in the last twenty years, and the gaming sector's growth is one of the most exciting changes to this city's image."

Zuta's mention of a city making two halves one whole is clearly a reference to the Berlin Wall – built from 1961 and dismantled back in 1989. Away from Germany, it's hard to imagine after nearly quarter of a century that the Wall still casts influence, especially in an industry like games. But it's clear the hangover of the 96 mile long barrier still has a part to play, and curiously, in its own way it has a positive effect.

> ***"From our experience Berlin has a huge advantage over other cities like Hamburg or Munich; and that is being Berlin."***
>
> Johannes Rolf, HitFox

ROOM TO GROW

"Berlin has a very dynamic web entrepreneur's scene," explains Kai Bolik, CEO of giant social and casual developer and publisher GameDuell. "During the last years the capital region developed into a real start-up hotspot; the Silicon Valley of Europe as it is already called. The basis for this development can be understood as a long-term result of the fall of the Berlin wall. It resulted in abandoned buildings and many open spaces for creative projects."

Subsequently, and in tandem with the appeal of Berlin's reputation as a party town, the city attracted young talent from other parts of Germany and from abroad, which accelerated the development of this multicultural melting pot.

"This development has been a catalyst for online games and other creative industries here in Berlin," continues Bolik.

The result is a place packed with creative outfits, with a games development industry that is presently enjoying something of a boom. At the same time, service and technology companies are also moving in on Berlin, attracted by the locale's fertile development sector.

"Other than Hamburg, Berlin has shown a vacuum for many years when it comes to online and mobile game companies," states Alexander Piutti, CEO and founder of free-to-play distributor GameGenetics. "This was exactly the reason for our decision to set up shop in Berlin."

Having decided it would be tough to compete for talent in Hamburg, as the area boasts so many high profile studios such as Bigpoint and InnoGames, GameGenetics decided Berlin offered more opportunity and less competition.

"Berlin has picked up speed quite significantly," says Piutti of the city's changes since his company set up shop. "GameGenetics has been able to attract a lot of talent, especially native speakers in key languages that we need to support our partners across the globe. In general, Berlin as the online and internet hub of Germany – if not Europe – has come a long way. Some 400 start-ups today have chosen Berlin as their home, many of which are truly international in nature."

Clearly, then, Berlin is going from strength to strength, and almost unanimously, its developers are confident the boom will only gain momentum.

TAKING TO THE GAMESTAGE

"Today we are in a state of a booming tech and start-up industry in Berlin," confirms Michael Liebe, project lead of the Deutsche Gamestage series of events and local games industry networking expert. "As there was no bigger industries in the region before and shortly after the reunion, people had to event their own jobs. There is no big publisher in the region, so there was no such ecosystem as you have it typically in other video games hot spots.

"People had the necessity to find other means of monetising the creative output. So it fits – and may be typical for the region – that modern distribution platforms for browser games or mobile games were established here."

As a result of companies of every kind leaping to address the opportunity of the newly blooming Berlin games hub. Thus, another strength the city is developing is variety, as Johannes Rolf, director of performance marketing at locally based HitFox ad2games reveals.

"Many different companies which are working within the same ecosystem come together in Berlin and this is a big strength of the games development sector here," says Rolf, whose team specialises in games-devoted performance marketing. "We have very talented and creative developers working on mobile, online and boxed titles, localisation studios, sound engineers, publishers, SaaS providers and companies like HitFox ad2games that specialise in the marketing of those fantastic games. Berlin offers everything you need when you want to work in the gaming industry."

Put like that, it sounds like Berlin has passed the tipping point for an ecosystem to flourish and established the critical mass needed for a near-autonomous development community.

The problem with booming, creatively strong and multicultural cities is that they quickly become expenses places to live, ▶

THE LOCAL PERSPECTIVE

GameGenetics' rise typifies the Berlin games boom. We speak to its boss Alexander Piutti

GAMEGENETICS OFFERS A typical example of a company harnessing the booming Berlin games development hub.

Founded in 2009 the outfit is a distributor of free-to-play games. GamesGenetics enables games publishers with media plans and distribution power to market their products more effectively, so as to speed up their global growth.

Today, it works together with high profile publishers such as Kabam, EA and Ubisoft, and boasts a portfolio of 450 browser and mobile games available in over 30 languages developed by a team of 180 development staff.

And from his position as founder of a thriving games business established relatively recently in Berlin, GameGenetics CEO Alexander Piutti (*above*) has seen first hand how the city's games business start-up culture has blossomed in recent years.

"It took a while to see Berlin's energy as a start-up ecosystem unfold," he explains. "Three things have played a major role for this to happen. Firstly, the city has become very attractive for local and foreign talent given its diversity and melting pot atmosphere; secondly the city has remained very affordable in comparison to other European hubs – you can enjoy a great standard of living for relatively small money.

"Finally, the state of Berlin has supported all along. Think for example of media.net's role to act as a fantastic umbrella for entertainment companies and IBB's role to provide financial support or significant subsidies – which GameGenetics thankfully also benefitted from €1 million in subsidies."

Piutti asserts that venture capitalists and business angels have also played a vital role in fostering Berlin's development.

www.gamegenetics.com

Top-to-bottom: Pascal Zuta of Aeria Games, Philipp Willers of SlipShift and Michael Liebe of Deutsche Gamestage

from London to New York. But that isn't the case with Berlin, where the balance of cost of living and quality of life favours the frugal.

"I believe the strengths of the Berlin games development sector are the low cost of living, this sense or feeling that Berlin is turning back into a centre for learning, developing and all things art and culture in general after a long absence from the stage that is the global theater, and finally, the push and pull of all the young people from across Europe who almost seem to be rushing into the city just to start-up, rise or fall, and then do it all over again," says Philipp Willers, MD of indie developer SlipShift.

SPOILT FOR CHOICE

The result of that appealing mix of creative variety, low cost of living and blossoming business is that increasing numbers find themselves compelled to work in Berlin. While, like any city, the German capital faces competition from across the globe, for now at least, local developers are finding themselves spoilt for choice when it comes to recruitment opportunities.

"The city itself is known as a hub for games development and publishing in Germany and it Europe as a whole," asserts Aeria's Zuta. "Its relatively low cost, high standard of living and international denizens, as well as a large English-speaking population, make it an attractive city for the kind of people we like to employ."

"From our experience Berlin has a huge advantage over other cities like Hamburg or Munich; and that is being Berlin," adds HitFox ad2games' Rolf in agreement. "Many people have fallen in love with this city, and more and more are attracted by it. Our team is very international and English is our operating language. This allows us to reach out to a huge number of talented people from all over the world who are already based in Berlin or willing to move here."

> ***"We need even better networking infrastructure, more programmes to support international expansion."***
>
> Michael Liebe, Deutsche Gamestage

All those extra staff only add to the growth underway in Berlin, which, as that former French culture minister pointed out, is changing as much now as ever. But to present the urban sprawl as a place without challenges would be inaccurate.

A NEW ERA

While games developers have practiced their art in Berlin for many years, much of the focus when locals discuss their games industry is on the new; fresh talent, recently formed studios and thoroughly modern business models. Yet there's always more to the story, and Berlin has its problems.

"Berlin has to be able to attract more heavy hitters as senior talent, now and in the long-run: seasoned experts in their respective fields when it comes to game development, marketing and IT for instance," says GameGenetics' Piutti. "The local industry is very motivated but still quite young. Over the next years, the ecosystem here needs to show it is able to produce a few more fascinating gaming companies. I trust this is possible."

In other words, Berlins' new wave of ambitious games makers and supporting organisations need to prove their worth, which is no easy task in an increasingly competitive, unpredictable business.

And, like anywhere, Berlin struggles with the problems that face studios globally, such as competition in new spaces from the industry's old guard. But in a place where the new kinds of games and platforms are the sector's bread and butter – such as social and free-to-play – that could be particularly difficult to solve.

"I don't believe this just applies to Berlin, but we seem to be moving towards a phase of consolidation and also a phase were a lot of the old, big players are moving into the market space that is online, mobile and all things social," offers SlipShift's Philipp. "This is both an opportunity to grow and a threat to existing studios; studios that might have gotten too comfortable in their particular niche of the market. The challenge is Berlin-specific only in so far as the concentration of small studios here is higher than in most other cities."

STRUCTURAL IMPROVEMENTS

Perhaps more pressingly, there's another struggle for hubs that thrive on their youth and contemporary savvy. Arguably more vital that service companies and tools providers being local, any industry nucleus undoubtably needs enough local investors, events and collaborations to oil the gears of its business machinery. And there, say some, Berlin struggles.

"We need even better networking infrastructure, more programmes to support international expansion, and most of all, better financing infrastructure," claims Liebe. "The German banks are still afraid of the dynamics the video games industry has and hesitate to invest in game companies. Also, more efficient immigration policies would help to find the appropriate talent for international game companies."

But it's not just the banks and border control that need to up the ante with regards to recognising the games industry. While some told *Develop* they felt well supported by official bodies in Berlin (*see panel 'The Local Perspective'*), others insisted more assistance is needed.

"Several larger regional associations try to support the games, web and media industries the best they can," puts forward GameDuell's Bolik. "But still, the games industry in Germany and in Berlin lacks a serious commitment from the political sector. Although some politicians seem to get more aware of the economic and technological potential and impact of games, parts of society still do not recognise games as serious business, but rather as potentially harmful for youth."

It's a problem that spreads its wings way beyond Berlin, but fortunately, the tables are beginning to turn in the city. Organisations like Berlin Partners and Investitionsbank Berlin are helping push the business into the forefront of the minds of politicians and decision makers.

Elsewhere, the local educational establishments are also making progress with supporting the region's sector, even if they cannot match the talent influx from outside of Berlin's boundaries.

"We have several media and game design academies here in Berlin," says Bolik. "Some regular universities also offer programs in these fields. So we are not lacking hungry junior talent, but everybody competes for the limited pool of the same senior professionals that can bring us to the next level."

LAND OF OPPORTUNITY

Whichever way you look at Berlin, it offers ample opportunities, and it's hard to refute the region's increasing status as a bona fide games development hub.

Berlin may never be Berlin, but it is every bit a place where developers' ambitions can become reality. ■

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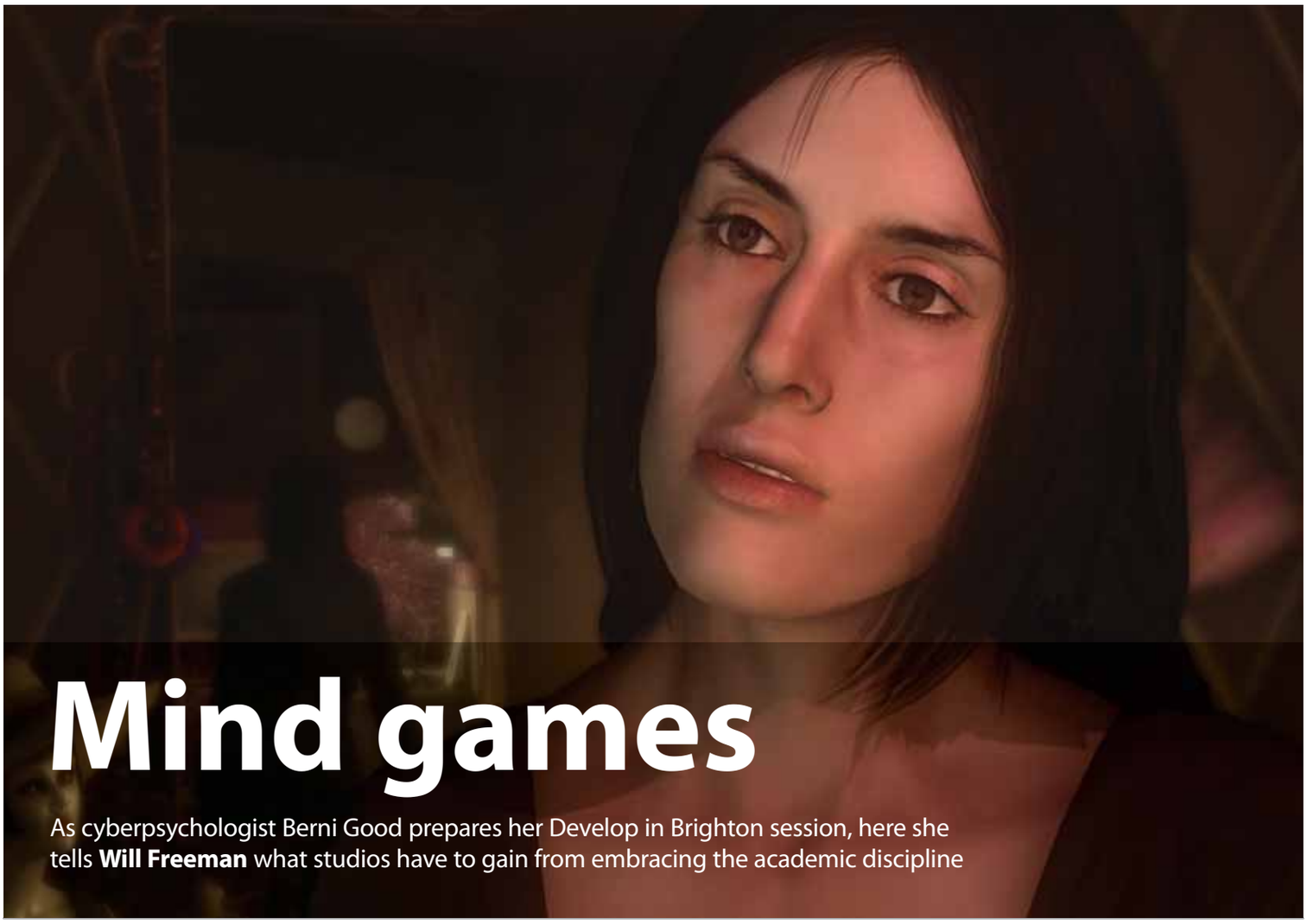

Mind games

As cyberpsychologist Berni Good prepares her Develop in Brighton session, here she tells **Will Freeman** what studios have to gain from embracing the academic discipline

Cyberpsychologist Berni Good (above) will use her Develop in Brighton conference talk to explore the relationship between the uncanny valley – which Good recognises in Heavy Rain (main) – and psychopathy

EVERY TIME A developer contemplates what a customer might like about a game, they're arguably tackling player psychology.

It's very different from the potential execution of true scientific psychology on the games making process, but, almost certainly, creating games is about understanding the human mind, and how to best please and reward it.

So it should come as little surprise that a new wave of academic psychological study around video games is underway, offering developers a fresh tool in their arsenal. As more experts explore how humans interact with technology, games developers with open minds can now employ new methods of understanding how to offer their customers the most well received – and most profitable – experiences.

One of those experts is 'cyberpsychologist' Berni Good, a former employee of the games industry with experience across marketing, branding and publishing, and part of the team that at the turn of the millennium made Game Domain a global succes story.

Good recently devoted much of her time to studies in cyberpsychology at the Dun Laoghaire Institute of Art, Design and Technology in Ireland, working alongside academics investigating everything from AI to virtual reality. It was there that she started to consider the value of her work to the process of making games.

"I realised there was an opportunity to look at all this academic research that is really gaining ground, and look at how that can be used in an applied perspective for today's developers," explains Good, who is currently putting the finishing touches on a talk to be delivered at July's Develop in Brighton conference. "This is about more than just upping the ante for the players' experiences; there's issues to be explored around ethics and responsibility, and what clinical aspects of games can be used in an applied perspective."

> ***"There is an opportunity to look at all this research, and how it can be used in an applied perspective for today's developers."***
>
> Berni Good, Cyberpsychologist

DO YOUR RESEARCH

According to Good, considering well-researched psychological theory in the games making process can offer much to studios, from bettering the mechanics and characters in their games to precisely satisfying the foundations of a player's innate desire for happiness.

"We can ask questions about what we can understand about the gamer's mind, in terms of increasing things like, for example, engagement and immersion, and better understanding of concepts like flow and character attachment," reveals Good. "We can learn about things like that by doing scientific research that is robust enough for developers to apply within their development model."

There, Good has hit on a distinguishing feature of the new wave of games psychology. The early work of those like the still-active Sherry Turkle, who investigated the relationship between human and machine in early MUDs in the early 1980s, was certainly of use to developers. But now more than ever, there is an emphasis on applied perspective. In other words, theoretical models of psychology are today built with practical implementation in the games design process in mind.

Take, for example, the way the broader psychological theory of self-determination has been re-appropriated with games developers in mind.

Self-determination theory looks at humans' internal motivations, needs and decision-making. Academics Edward L. Deci and Richard M. Ryan can take much credit for establishing the theory, which is over 30 years old and famously reliable as a model. It's an example of a eudemonic approach – meaning the science of happiness and personal wellbeing in layman's terms. People, the theory states, have innate psychological needs that are the basis for both self-motivation and personality integration. The theory states that those needs are 'autonomy', 'relatedness' and 'competence', and all are relevant in the way a player interacts with and enjoys a video game.

Autonomy, to a psychologist, is our ability and desire to have freedom over our own

actions. It's important in order to feel fulfilled, and it's something games designers can harness to make their games more enjoyable through giving the player choice.

Similary relatedness – the intrinsic need for interaction with others – and competence – the necessity of achieving in life – can be specifically applied to games design.

"Games can really address intrinsic needs we have as human beings. Being able to make your own choices in life can help self-esteem, make you feel happier and motivate you," states Good. "Incorporating that thinking into the design of a game, through things like player choice, will really improve the experience for the game player. And it's satisfying needs rather than wants; those intrinsic needs."

Academics Scott Rigby and Richard Ryan went on to develop this approach into the 'player experience need satisfaction' or PENS model – a commercial standard that games developers can use to determine if a game is meeting a player's needs in this regard.

"A lot of developers already incorporate many of these things into games, but do they know why, and do they know how they can refine that incorporation considering different genres and different platforms?" ponders Good, who concludes that developers can be served very well indeed if they look at the growing body of psychological research around video games, utilise that study by applying it to their projects, and always make sure they critically evaluate the research and its validity.

DEV THE RIGHT THING

It is clear, then, that considering psychology and how it can impact the way a player absorbs and enjoys your game could have stark critical and commercial benefits for your game. But, says Berni, psychology can offer a developer more than that.

"I can't stress enough here how much psychology can help with the ethics of games," she insists. "I personally have very, very positive things to say about games and they ways they can impact people, but there are other consideration that could have ethical implications around issues like addiction and monetisation. And I believe games developers want to be ethical in these situations."

It's vitally important to consider, but not the subject of Good's Develop in Brighton talk, which will be tackling another element of games psychology, and one that is focused on a near iconic theoretical chasm.

"I'm actually going to be talking about psychopathy within the uncanny valley. There's been some really interesting research from a group of academics led by Angela Tinwell. She's very kindly agreed for me to incorporate some of her research into my talk, and that is going to be about how gamers may be potentially turned off by perceiving psychopathic traits in a game's character that may exist in the uncanny valley."

The Develop in Brighton conference takes place from July 9th to 11th at the Hilton Brighton Metropole in Brighton, UK. ■

www.developconference.com

RECOMMENDED READING

CYBERPSYCHOLOGIST BERNI good has picked a selection of books for games developers looking for an entry point into the sometimes intimidating world of games psychology.

• *Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution* by Jim Blascovich and Jeremy Bailenson (2011)

• *Glued to Games: How Video Games Draw Us In and Hold Us Spellbound* by Scott Rigby and Richard Ryan (2011)

• *Artificial Psychology: The Quest for What it Means to be Human* by Jay Friedenberg (2008)

Meanwhile, the following published academic papers and research models are referenced in the articles across these pages:

• Edward L. Deci and Richard M. Ryan – *'Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being'*

• Scott Rigby and Richard Ryan with Immersyve, Inc. – *'The Player Experience of Need Satisfaction (PENS)'*

• Angela Tinwell, Deborah Abdel Nabi & John P. Carlton – *'Perception of psychopathy and the Uncanny Valley in virtual characters'*

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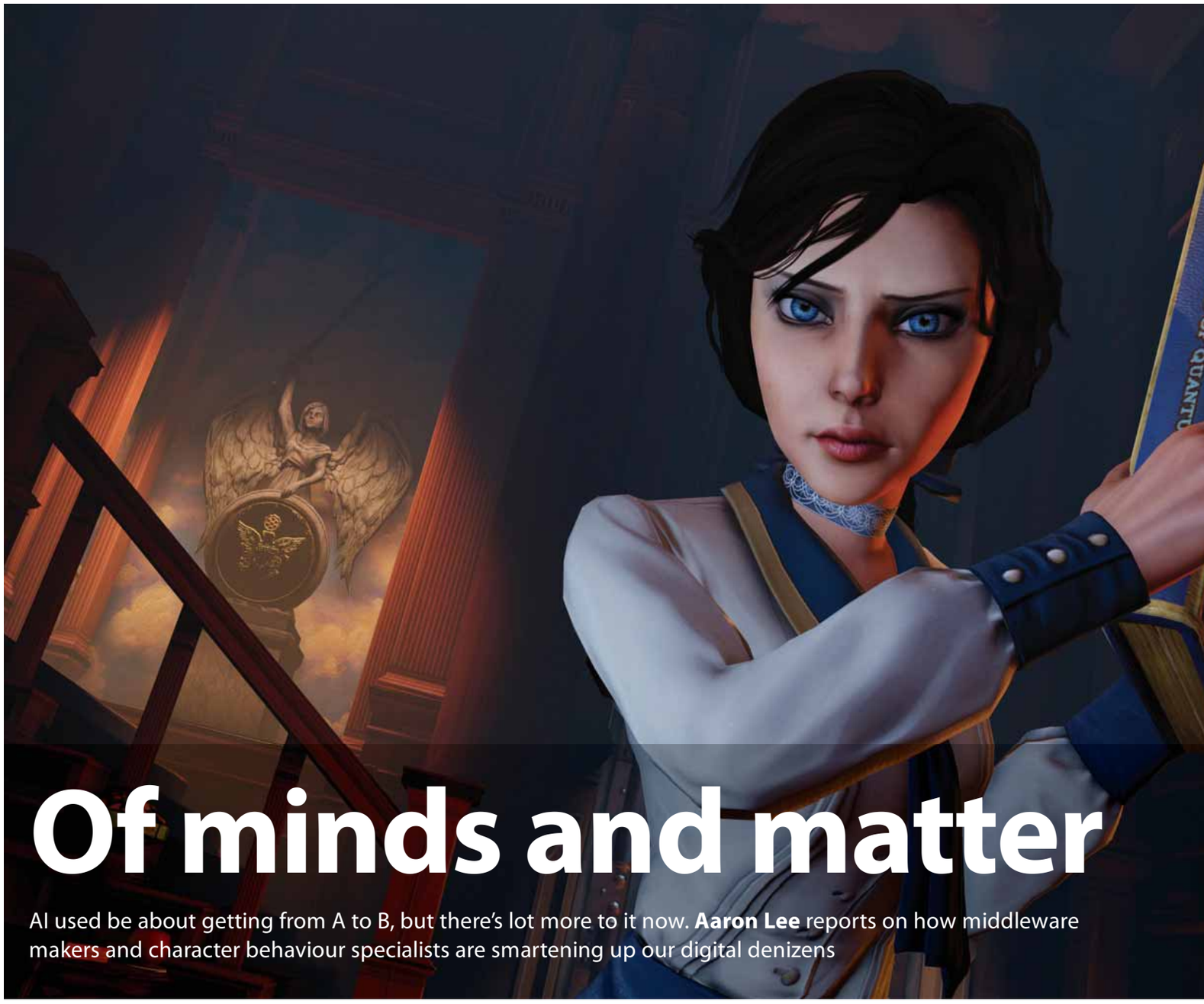
Masterminds

Develop reports on the challenging AI space, where game characters are being instructed to perform in ever more convincing ways, using new tools and new methods, p32

Motive refines motion capture p38

Develop Conference audio preview p41



Of minds and matter

AI used be about getting from A to B, but there's lot more to it now. **Aaron Lee** reports on how middleware makers and character behaviour specialists are smartening up our digital denizens

Top-to-bottom: Havok's Ben Sunshine-Hill and Autodesk's Guillaume Aldebert. Main: Elizabeth from BioShock Infinite

HUNKERED DOWN BEHIND a pillbox, you reload as bullets whip passed overhead. The enemy is closing in. A voice calls out to you. You have to move, now.

You leap to your feet, only to find Private Porkins blocking your path – he's caught himself on a verge again and, worst still, he's broken the illusion.

Artificial intelligence is one of the chief aspects that makes a game believable. It governs pathfinding, character behaviour and a wide selection of other operations behind the scenes.

The burden on AI, and developers, to maintain a game's believability, is a heavy one. The example above is just one of many goofball moments that players will recognise. But while it's easy to criticise games' AI, tools developers, such as Autodesk principal engineer Guillaume Aldebert, argue that significant advancements continue to be made in this field.

The worlds that developers envision are becoming more complex and detailed, and as games become present on a plethora of new platforms, each with varying processing capabilities, the challenge for AI creators is to cater for an increasingly unpredictable array of needs.

And, of course, with the coming of new games hardware, expectations are running high for games to achieve new levels of immersion.

> ***"Elizabeth embodies how an AI-driven companion can enrich the game experience, without hindering it or burdening players."***
>
> Guillaume Aldebert, Autodesk

SMART AI

To start with however, let's look at where AI is today. By Aldebert's account, it's in a good place.

"*BioShock Infinite* is a milestone in what can be achieved with smart AI. Elizabeth embodies how an AI-driven companion can tremendously enrich the game experience, without hindering it or burdening players," he asserts, praising Irrational Games' formative current-gen title, which made use of yet to be specified Autodesk tools to give its personable heroine a mind of her own.

BioShock Infinite also impressed PathEngine owner Thomas Young, who was pleased to see that the development team and 2K Games made a "big deal" of how key AI was to the game, and considered it to be a marketable product feature.

"Bad AI can definitely break the immersion, and I think that just 'not doing stupid stuff' is a really important goal for game AI in general," Young acknowledges. "It's not so clear how important this actually is to players in general, though. If we look at something like *Skyrim* for example, where there was a whole lot of criticism about the AI, but the issues in this area didn't stop the game going on to sell extremely well.

"But the technology is certainly there for implementing more robust interactions with the AI, and I think that players' minimum expectations will inevitably increase as they see more and more titles that do this well."

SMARTS ON YOUR SMARTPHONE

Autodesk's Scaleform demo is on mobile

THOUGH TRIPLE-A and the demands of high-end games have got the attention of AI makers, they've not forgotten about the rapidly expanding mobile market.

The challenge, then, is to provide tools that meet these two markets, which are converging in some areas, but continue to be worlds apart in others.

"Mobile platforms are increasingly powerful and common, so in theory, we could deliver console type gameplay experience, the ones requiring advanced AI," predicts Autodesk's Guillaume Aldebert. "The input system (touch screens) and smartphone player demographic drives the gameplay experiences toward arcade games – *Angry Birds*, *Cut the Rope*, *Temple Run*, or social competitive/collaborative game design. But as time passes, the evolution of mobile gaming will begin to require advanced AI systems to deliver increasingly elaborate experiences.

"For instance, your game design might be different from a traditional console title, but as soon as you need an autonomous navigating entity, you will require an advanced AI system. And with the production values and player expectation continuously increasing, mobile developers will want to use tools that are accessible."

TECHNOLOGY WILL SAVE US

PathEngine is one of the companies working to improve games through its AI systems technology. The defining factor behind its approach to pathfinding technology is to make it robust enough to alleviate the time constraints that frequently impact production.

"Time constraints are definitely significant, as you can get some behaviours working for a limited set of circumstances quite quickly, but it takes a lot longer to ensure the behaviours work in all of situations, with all possible player actions and so on," says Young. "And similarly, on the technology side, you can get basic tech up and working very quickly for a limited set of scenarios, but it's much harder to make your technology both robust and general for all situations and all possible player interactions."

To solve the never-ending issue of time constraints, Autodesk's Aldebert says it's about providing a fast, iterative data production workflow.

"Autodesk Gameware Navigation provides fast, iterative, multi-sector navmesh generation. Being able to visualise and test your navmesh as fast as possible enables the level designer to iterate more, and to focus on his design instead of technical issues," he says, adding: "We have seen the rise of systems such as behaviour trees designed to help iterate faster. The faster you can adapt your AI behaviour, the more tuning you can do to your gameplay. Even for low-level AI, it is important to be able to debug and understand what the pathfinding is doing."

Epic Games, too, sees technology that provides greater efficiency as the starting point for AI's progression.

"We're trying to help address this issue in a couple of ways with Unreal Engine 4," Epic's senior engine programmer Steven Polge tells *Develop*. "By providing robust underlying systems, such as the navigation mesh, we enable developers to focus on creating the custom AI behaviours for their games earlier in the development cycle.

"With the Blueprint system and other tools, we're focusing on improving designers' workflow and making it easier for them to iterate on NPC behaviour throughout the development of their games."

And that's not all Epic have added to UE4 as far as AI is concerned: "We've improved the performance of pathfinding and pathfollowing, and made it fully asynchronous, so the work can be done on a separate thread, reducing the performance impact of AI. We also support asynchronous dynamic navigation mesh modification with very high performance, allowing the AI to effectively navigate through a changing environment without a significant performance hit. Our navigation mesh also has easily extensible support for adding special links and modifiers for complex navigation."

DEFENSIVE CODING

AI developer Ben Sunshine-Hill of Havok says facing the challenge to maintain immersion in games comes down to "defensive coding". "To some degree that means contingency plans for your contingency plans. But it also requires a very careful and analytical approach to development," explains Sunshine-Hill.

"There's a temptation to concentrate on the 'common case' during AI design, with behaviours that look their best when the player's playing along and everything's going right, and to add special case handling later, as testing reveals specific weaknesses in a character's AI.

"But this approach becomes unsustainable as AI becomes more complex. Special-case fixes tend to breed new special-case failures. Instead, there needs to be a constant focus on elegance and robustness; on techniques that are provably applicable to every corner of their problem space."

Havok's own AI technology has been used in *Guild Wars 2*, *Halo 4* and the recent *Devil May Cry* reboot, and these titles exhibit some of latest advancements in the field.

The most prominent change, Sunshine-Hill says, has been the rise of animation-driven locomotion (ADL), where a character's velocity in the world is entirely determined by the character animation system.

"This is a huge step forward for animation quality, and it's been a long time coming in the triple-A space, but lately it's being leveraged by smaller teams as well. ADL is a challenge for conventional pathfollowing and collision avoidance systems, which aren't used to having their motion decisions reinterpreted, smoothed or countermanded entirely. So the challenge in the pathfinding space is to design systems that stay robust and effective under these conditions," he explains.

Pathfinding, or the process of giving game characters the logic to successful navigate the gameworld, remains a chief priority of AI software makers. However, as AI specialist and CEO of Xaitment, Mike Walsh, states, the focus is shifting to character behaviour.

"Gamers and games developers want characters to have multiple behaviours and react in more realistic ways. Players want characters that can demonstrate different behaviours depending on the situation."

On and interactive level, there's much enjoyment to be had from the seemingly endless collection of semi-connected tasks and quests in the two most recent *Elder Scrolls* games. But where the games fall down is giving characters the intelligence and range to treat situations in context.

Top-to-bottom: Xaitment's Mike Walsh and Epic Games' Steve Polge

Above: PathEngine's Thomas Young. Main: DmC: Devil May Cry by Ninja Theory makes use of Havok AI tech to give life to its legion of dark creatures

For instance, if a player engages an NPC in conversation, they expect to see more going on than a handful of stock gestures or head movements for every encounter. Characters need to loosen up, and communicate with their bodies as well as their lips.

Contrary to what some think, achieving this is not the sole responsibility of engineers, argues Xaitment's Walsh.

"We've seen a shift from AI being an engineering-centric problem towards one that includes design and often art as well. Designers and artists need tools that they can work with to help bring their visions to life, as opposed to relying on engineering to hard code something in the engine," he says.

"The next generation of characters will have to demonstrate multiple behaviours in complex environments. Typically development teams have handled character behaviours with scripting. The level of character sophistication often depends on how well the development team can structure and maintain all of the scripts. Games are becoming much more complex, and thus developers are looking for an alternative system to handling complex characters in complex environment."

ADDITIONAL INTELLIGENCE

Speaking of next-gen, on the surface it would appear AI development stands to gain much from the increased processing power of the PS4 and Xbox 360 successor.

"I think the additional CPU power and memory will allow 'bigger' games: a larger number of NPCs with more natural interactions such as in crowds, larger scale environments with denser and richer annotations to help with the spatial reasoning or uncommon navigation schemes," predicts Autodesk's Aldebert.

However, besides hardware power, the quality of the character behaviour will be strongly dependent on the software tools, he adds.

Xaitment's Walsh agrees: "Beefier machines don't create better AI by themselves. They simply allow for more complexity. It's the designers, engineers and artists in conjunction with better tools that are needed to create better AI and better games."

Essentially, says PathEngine's Young, there are some areas where better hardware can help with AI, but, he says that, in many cases hardware capabilities are not what's holding AI implementation back. Improved graphics and animation fidelity actually increase the cost of implementing better character behaviours, he warns, and believes its issues like this that are making top-tier games even harder to tune.

> ***"We've seen a shift from AI being an engineering-centric problem towards one that includes design and often art as well."***
>
> Mike Walsh, Xaitment

"I think there's a problem with triple-A titles being fundamentally hard to scale, which isn't going to be solved by the next-gen hardware improvements, and in order for us to see really big improvements in AI and character behaviour it may be necessary to find ways around these kinds of scalability issues.

"Moving towards more procedural generation is something that can be interesting from this point of view, and automating content generation processes is definitely a good idea," says Young.

What's certain is the range of tasks AI is expected to undertake is growing. Havok's Sunshine-Hill says AI will need to respond to a wider selection of natural inputs, such as voice commands.

"New hardware supports new modalities of interaction, and those place new demands on AI," says Sunshine-Hill. "Speech recognition is a good recent example of this. Directing AI-driven squad mates with spoken commands requires semantic and spatial reasoning techniques we've never needed before. And in this next generation, as game worlds become more physically dynamic, we'll need AI which can instantly comprehend and react to changes."

So a time when entire portions of a game can be controlled through voice commands, or even conversation – such as *Mass Effect*, *LA Noire* or Sony's somewhat fanciful Eyedentify tech demo from years back – may be on the horizon.

99 PROBLEMS, BUT A BRAIN AIN'T ONE

Before all that though, the experts say there are plenty of challenges that still need to be addressed. Complex and increasingly reactive animation systems pose a lot of constraints, Autodesk's Aldebert says. Foot planting, inertia, jumps, ladders, or unique, irregular character moves can all create constraints that make it more difficult to plan the movement of NPCs, he says, so "we always need to anticipate how game design and level design might evolve, in order to update the tools we use to meet the expectations of developers, who are trying to meet the rising expectations of players."

For Sunshine-Hill, providing Havok AI tools means not leaving developers with excessive amounts of customisation to do before they can use a tool.

"As a middleware developer specifically, the biggest challenge I face is providing AI tools which don't require too much tuning or customisation by the end user," he explains. "It's easy to expose a hundred knobs to turn, but they're useless if it isn't immediately clear which ones to tweak in order to accomplish a particular effect, and worse than useless if some of them need to be tweaked before things will work at all. I'm constantly looking for ways to replace 'tune this variable until you find the right answer' with 'the system automatically solves for the right answer'."

As well as more efficient tools, Epic's Polge says the key challenge is also making the AI's actions and thought process clearly discernible to the player, and effectively using AI to provide interesting challenges and enrich the game experience.

There are many tests ahead for this field of development, but it's no exaggeration to say that the best is yet to come. Getting there will require collaboration as much as technology, as Xaitment's Walsh concludes: "AI is an interdisciplinary problem because it involves design, art and engineering. The really cool behaviours need to be visualised to demonstrate they are occurring at the right time. AI designers, engineers and artists need to work closely with each other to produce seamless game AI.

"Ultimately, designers and artists need increased creative control, but they are usually reliant upon on engineering to get content into the game engine. The trick is to enable the design team by providing them with the tools necessary to create any character behaviours, whether for robots, pets or aliens. Tools that would provide a visual representation of the problem, allow design and art to rapidly iterate, re-use assets and also debug. This would enable designers and artists to improve AI and, more specifically, character behaviours." ■

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KEY RELEASE

Will Freeman examines what mo-cap tech Motive brings to performance capture

What is it? A software for managing the motion capture process from set up to performance, editing and exporting
Company: OptiTrack
www.naturalpoint.com/optitrack

Brain Nilles of OptiTrack says his mo-cap workflow software will help improve efficiency for games teams of all sizes

IN RECENT YEARS OptiTrack and its sister outfit NaturalPoint have made great strides in the games development sector.

The former provides motion capture hardware from affordable, portable solutions right through to cutting-edge cameras capable of handling high volume spaces and complex scenes. And now OptiTrack has a new software offering in the form of Motive, which provides a platform for managing the entire system of an OptiTrack mo-cap setup, from calibration, filming and real-time processing through to the edit processes.

Motive incorporates OptiTrack's existing engineering into a unified architecture designed to be both flexible and powerful enough to tackle even the most ambitious optical tracking applications.

QUICK WORK

"We've streamlined the entire process of motion capture – from initial set-up and daily prep, to operation during the shoot, through to post-production and export," explains Brian Nilles, chief strategy officer at OptiTrack. "We really left no part of the workflow untouched. To give you a sense of scale, we've reduced typical set-up and shoot preparation times by more than 75 per cent."

Such a reduction in the friction of the front end of a mo-cap project might sound like a grand claim, but a closer look at Motive does reveal a highly specialised product with the potential to impact studios embracing motion capture tremendously.

In addition to the workflow changes Motive introduces, the middleware's core is 64-bit and native real time, which when paired with OptiTrack's existing catalog of motion capture cameras, provides a system optimised heavily towards 3D precision. Mo-cap is about capturing every nuance of a given performance, and increasingly there is a demand for, and expectation of, the ability to catch even the slightest movements of the face and fingers. Precision, then, is more important than anything else, and that is where Motive promises to shine.

> ***"One triple-A game developer commented that Motive turned two hours of daily prep time into just 20 minutes."***
>
> Brian Nilles, OptiTrack

"Furthermore, because Motive is an open motion capture platform, our free SDKs enable developers to access data at essentially any step in the mo-cap pipeline – from direct camera access, to labeled and unlabeled markers, to solved skeletal data, and everything in between," continues Nilles.

"This open architecture gives Motive users the freedom to tailor data streaming and solving to match any existing workflow currently in use today. That means customers who have already invested in a pipeline, they can bolt the Motive platform into place and enjoy all the benefits of the OptiTrack solution without rewriting their pipeline."

ONE FOR ALL

Such tailoured tech might sound like it would lurk in the exclusive realm of the triple-A studios, but according to OptiTrack, of its 2,200-plus installations, many are at small and medium sized studio's sites. And apparently Motive was created with that entire spectrum of studios in mind, from tiny outfits to vast multinational development houses; both of which benefit equally from saving time through streamlined workflows.

"One triple-A game developer commented that Motive turned two hours of daily prep time into just 20 minutes," reveals Nilles. "Smaller indie developers can enjoy the same streamlined process and manage shoots with less setup and prep time, with a faster pipeline."

Unsurprisingly, Motive is heavily optimised specifically for its creator's camera range – which includes the powerful Prime 41 and the affordable, compact V100:R2 – but OptiTrack hasn't blocked out potential users already committed to other solutions. OptiTrack's tools remain open to developers, meaning that they can be easily integrated into existing real-time or offline pipelines.

For some time, OptiTrack has provided cameras more suited to smaller outfits, and positioned itself as a champion of democratising motion capture. Motive, say its creators, continues that devotion to making mo-cap something available to every studio.

"From the very beginning, we've believed that motion capture never should have been so expensive, nor so hard to do," concludes Nilles. "Motive is a great example of an engineered solution that makes mo-cap production easier for our customers every step of the way. In our experience with customers of all types, the smiles become quite regular after we show them the first dozen items that will make their lives easier – and by the 20th, they are simply blown away." ■

MICROSOFT SPOTLIGHT

We spoke to student developer Michael Cameron about how his involvement with the Windows Games Ambassadors programme has helped his career prospects

Windows Games Ambassadors
Company: Microsoft
Who are they? A team of student ambassadors
What is it? A programme to create enthusiasm for Windows as a development platform, through blogs, social media and events
www.windowsgamesambassadors.co.uk

A PERENNIAL ISSUE in the games industry is finding new talent. But the next step is equally as important: giving that talent the attention and guidance to help it shine.

Windows Games Ambassadors is an initiative that's helping to do just that by engaging with student developers and inviting them to share their experiences of developing for Windows 8 and Windows Phone 8. More than that, though, the ambassadors are also there to inspire and assist their peers.

Michael Cameron, a computer science student from West Lothian, Scotland, was one of the successful applicants.

The 23-year-old explains how the programme hasn't only improved his employability and skills, but also allowed him to play a pivotal role in the journey of his fellow student developers.

BUSY PUPIL

"For me, I saw a huge opportunity. I am only a first year and when I applied I did not think I would get it," says Cameron, who studies at the University of the West of Scotland, and applied to be an ambassador in December 2012. "Knowing that I would likely not get any internships I knew that having Microsoft on my CV would be invaluable. However, I did get it and now my prospects couldn't be better."

A keen developer himself, it was Cameron's creative flare as much as his enthusiasm that Microsoft saw in him. He has his very own Windows Phone game, *ImiJump*, coming out under his BusyPixel alias, and is also the president of his university's games development society.

"I have been really surprised by how easy it is to develop for the Windows platform and how much help there is available to guide you through it. Microsoft have, for a long time, been keen to help students do this by providing things such as DreamSpark, free developer licences and Microsoft Virtual Academy," he says.

As one of 17 ambassadors based in the UK, Cameron acts as a connection between Microsoft, students and indies.

"It's great being involved in the programme and, being part of it, we have been able to do so many exciting things. We have been to different events, such as the Unity and Windows 8 Beta hackathon that was run at Modern Jago. We also have access to an amazing catalogue of software, learning and support through the MSDN [Microsoft Developer Network].

"On a day-to-day basis, we all attend our respective universities and engage with the students," he tells *Develop*. "We organise events for the students such as game jams and workshops, and also interact with the academic staff to try and improve the university's facilities for app developers."

Most of the ambassadors use online tutorials that they have created or been provided with to teach students. They lead workshops were students can ask for help on building an app and events such as game jams to learn specific skills in a short period of time. And when they aren't engaging with students directly, Cameron and his fellow ambassadors are posting on Microsoft's community sites as well as others, such as the Ubelly gaming blog, to pass on their knowledge to other aspiring developers.

> ***"The Windows Games Ambassador programme has helped boost my confidence in all aspects of app development."***
>
> Michael Cameron, BusyPixel

INSPIRATIONAL FIBRE

For Cameron, there was a specific moment that he realised he's been part of something special with WGA.

"It was after the previous game jam run at UWS [in April]. Our winner, Martin Grant, has received exceptional success in the Windows 8 store with his game *Unicorn Space Command*. The game has shot up in downloads and had a popular response from Microsoft also. It has been featured on MSDN blogs, Ubelly and my own," says Cameron. "Martin was incredibly grateful towards me for encouraging him to enter the game jam and the support I provided during it. Knowing that I helped this student get recognition for his game made me realise that what I do is really important, which in turn made me feel great about what I do."

Having learned a huge deal about Windows development and passed on his knowledge to others, Cameron is now looking at internships for the summer, which is something he hadn't envisioned, and feels his prospects have been lifted thanks to his involvement in the scheme.

"The Windows Games Ambassador programme has helped boost my confidence in all aspects of app development. I have been able to create apps for Windows 8 and now have to confidence and ability to pass this knowledge onto others so that they can do the same," Cameron concludes. "The programme has provided a great opportunity for me and has been very beneficial to the students at my institution. Whether that has been through development talks, game jam events or just by having someone to point them in the right direction, students can now see the immense opportunity that developing for Windows 8 and Windows Phone has to offer." ■

busypixel.wordpress.com

Student by day and games ambassador by night, Michael Cameron (above) has found much worth in his activities outside of the classroom (main)

UNREAL DIARIES

Epic on bringing feature-rich C++ gaming experiences to the web

Epic Citadel running in HTML5 on the web, as seen at GDC, offers a tantilising glimpse into the near-future of feature rich browser gaming

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THE WEB JUST became a much friendlier platform for beautiful, high-quality games, thanks to the latest advances in web technologies and Epic's ongoing collaboration with Mozilla.

Engineering teams at Mozilla and Epic Games recently ported Unreal Engine 3 to the web in just four days using the powerful combination of asm.js, a highly optimised subset of JavaScript, and Emscripten, which enables developers to compile C++ code into JavaScript.

THE SCALE OF THINGS TO COME

Epic then demonstrated *Unreal Tournament 3* in HTML5 at the Game Developers Conference and released *Epic Citadel* on the web running in HTML5.

Developers can now achieve fast performance that rivals native while leveraging the scale of the web, without the additional costs associated with third-party plug-ins. Bringing visually stunning, performance-intensive games to billions of people on the web is now a reality.

Epic Citadel is built using standards-based technologies such as HTML5, WebGL and JavaScript, and should work in any standards-based browser implementing those features.

FPS ACCELERATED

The app's benchmarking mode has been a big hit with the community as well. Many users have posted screenshots with readouts of 150 fps and higher.

To try *Epic Citadel* for HTML5, download Firefox Nightly at **nightly.mozilla.org** and then visit **unrealengine.com/html5** for a preview of the future of gaming on the web. Instructions on how to unlock the framerate are located within the FAQ. ■

Epic is hiring! To find out more visit: **epicgames.com/careers**

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HEARD ABOUT

John Broomhall looks forwards to the Develop Conference's audio track

Develop Conference 2013 – Audio Track
Date: Thursday, July 11th
Venue: Brighton, UK
www.developconference.com

Main image: The Hilton hotel in Brighton, where the Develop Conference takes place. Photo by Gillian Broomhall

IT'S THAT TIME of year again. Very soon, the game audio fraternity will be heading off to buzzing Brighton for this year's one-day Develop Conference Audio Track – a regular fixture for anyone involved with or aspiring to be involved with the business, technology and creativity of making music, sound and dialogue for today's – and tomorrow's – video games. The programme promises a thought-provoking set of sessions for both in-housers and freelancers alike, delivered in a collegiate atmosphere, including:

Sound and Music: Best Friends Forever – Comms and Influence for Better Results
Jo Orland, senior sound designer, SCEE; Jim Fowler, music production supervisor, SCEE
Sound design and music are often thought of as separate entities by developers (and even by audio teams). By working together from the early stages of development, we can not only produce a more coherent audio experience, but also use our combined might to get better support from the wider team.

Using examples from games worked on over the last 12 months by Sony's Creative Services Group, Jim and Joanna will explain how working together – from creative pitches through to implementation and bug fixing – allowed them to produce more cohesive projects. Communication and influence techniques will be discussed in order to inspire sound designers and music composers to present a united front for better, faster, stronger results.

Let's Stop Re-inventing the Audio Wheel
Tom Colvin, audio lead, Ninja Theory
Game audio middleware companies have done an excellent job of creating tools that are now near ubiquitous in the console game environment. However, there are many things they don't do.

The current paradigm is that the game will trigger a sound 'event' (with parameters if necessary) which the middleware engine then takes care of. This means game developers still have to write a lot of code to do all the other things that happen before that point.

Digital audio software provides a great example of how these tools could work, but the game engine equivalents are nowhere near this level. This seems like a missed opportunity. Whenever tools get standardised, everyone benefits. This usually happens because someone makes a brilliant solution that everyone starts to use. It may not even be the best tool for the job, but its existence as a standard platform allows people to worry a lot less about technology and a lot more about creativity. I want to spend more time doing creative audio work, and less time worrying about how to make it work. I hope we can start a discussion that may eventually lead to more standardisation of game audio tools.

Artistic Expression In Game Audio Design
Chanel Summers, co-founder, Syndicate 17 and Adjunct Professor, USC School of Cinematic Arts, Interactive Media Division
Game audio has come a long way when measured by quality and advancements in technology, but still trails other art forms when it comes to artistic expression. Modern technology now makes it easier than ever to create high-quality production audio but does nothing to advance the greater goals of high artistry and meaningful work. Indeed, it can be demonstrated that the emergence of advanced audio technology in less skilled hands is often the enemy of artistic value, as it provides so much freedom to over-produce and over-implement sound in games. Given such infinite flexibility, how can game creators begin to make better and more memorable sound by using less, being cleverer, viewing the acoustic environment as a musical composition, and having a better understanding of the principles of cinematic sound design?

Summers will discuss how employing proper aesthetic principles to drive the latest game audio specific tools, technologies, and techniques can enable content creators to push audio, and games themselves forward in an emotionally impactful way.

If game audio's your thing, there really is only one place to be on July 11th, in Brighton, checking out our speakers' latest ideas, thinking and innovation, networking with them and partying beside the seaside. We very much look forward to seeing you and also hearing what you have to say in the customary open mic closing session.

We have much to learn from each other. Come and be inspired.

The Develop Conference's audio track runs on Thursday, July 11th.

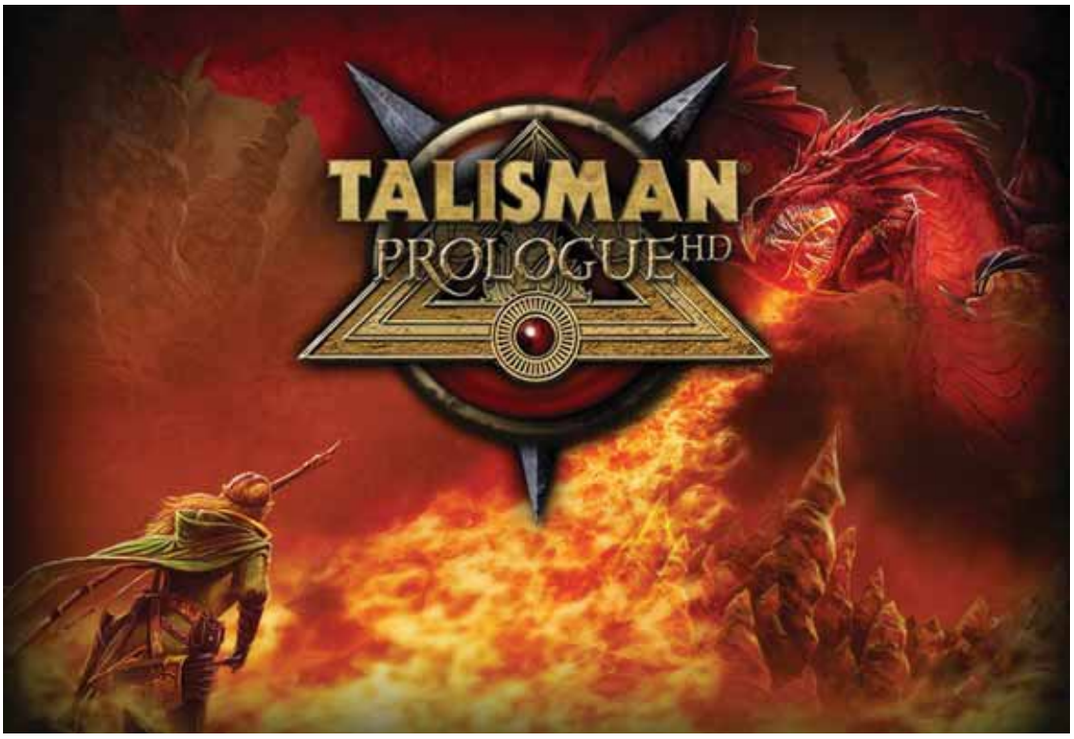
Visit **www.developconference.com** for full programme details or join the conversation on Twitter via **@developconf**. ■

John Broomhall is an independent audio director, consultant and content provider.
E: develop@johnbroomhall.co.uk
www.johnbroomhall.co.uk

MADE WITH MARMALADE

Devoted tabletop fans Nomad games wanted to share Talisman Prologue with as many gamers as possible. Marmalade made that vision possible

Talisman Prologue
Developer: Nomad Games
Platform: Android, BlackBerry, iOS, PC
Why Marmalade mattered: Drawing on existing experience, Nomad transitioned from PC development to a multiplatform mobile release within six months
www.nomadgames.co.uk



Nomad Games' Don Whiteford (above) says Marmalade had the flexibility and reach his studio needed to launch its digital version of Talisman (main image)

WHEN NOMAD GAMES was formed from the demise of THQ's Warrington Studio in 2011, the path for the console veterans was clear: diversify and conquer the mobile space.

According to commercial director Don Whiteford: "We had already seen some big console projects at other studios being downsized, and our last two games – *Red Faction: Battlegrounds* and *Warhammer 40,000: Kill Team* – had been designed as fast, download-only console games for THQ. We made the decision to switch across to mobile as it looked like big-budget boxed games were going to be increasingly marginalised".

Having previously worked on a wide range of properties and genres including the *Juiced* racing series, Nomad's staff had well-established credentials as a studio-for-hire. Following their departure from THQ, Whiteford's team were quickly able to secure a deal with Games Workshop, IP owners of one of their previous games, *Warhammer 40,000: Kill Team*, with a proposal to reinvent the classic 1980s board game *Talisman* for modern touchscreen devices.

According to Whiteford: "We liked the idea of focusing on virtual board gaming because as a genre it's very well suited to touch screen controls. Our designer, Carl, is a huge *Talisman* fan and our artist, Andy, has been a *Warhammer* miniatures collector and painter since his youth. There's a lot of passion for the product here."

TABLETOP KINGDOMS

Given board gaming's natural fit with touch screens and the rising importance of both tablets and smartphones, Nomad wanted to ensure that none of the game's fans should miss out. Don Whiteford: "We saw tablet-based board gaming growing in popularity and have always considered cross-platform development as an important approach to ensure everyone gets access to the games we make. Our background working on console and PC prepared us for this in a way that I think some newer studios miss out on. We shipped *Juiced 2* on six platforms, so our minds were set on putting *Talisman Prologue* in as many gamers' hands as possible."

> ***"We evaluated several options to check for ease of cross-platform deployment; Marmalade was the clear winner for us."***
>
> Don Whiteford, Nomad Games

This meant the team needed a development tool that would enable them to satisfy the very high standards of quality expected on Apple's devices while also delivering performance and compatibility across a range of differently specified Android devices. Whiteford explains: "We evaluated several options to check for ease of cross-platform deployment and compatibility with our own coding practices. Marmalade was the clear winner for us."

In spite of their clear mission to target mobile devices, Nomad decided to draw on their previous experience of console and PC development by using Marmalade to deploy to PC first, with the game being made available for download from a dedicated website as well as marketplaces including Intel's AppUp store. This allowed them to focus on making the game as complete and playable as possible, before tackling the unknown challenges of deploying to mobiles and tablets.

Whiteford clearly considers using the PC as a 'soft launch' platform to have been very productive for Nomad Games: "We targeted PC first, mainly because it offered a more familiar environment and allowed us to concentrate on building a quality game before tackling mobile technology head-on. By the time we deployed to smartphones and tablets, *Talisman Prologue* was already a tried and tested game – the PC version even works with touch screens."

EASY PC

Following the completion and successful launch of *Talisman Prologue* for PC, the process of deploying and testing on three different mobile and tablet platforms was completed within five months. BlackBerry, iOS and Android devices were all supported in rapid succession, attracting critical and commercial success which was helped initially by the existing fanbase of the *Talisman* property. Whiteford explains: "One of the key decisions in producing our first mobile game was creating something with a great licensed IP. We're seeing an increasing number of amazing games with brilliant original concepts struggle to get noticed on mobile, and having a fantastic established product like *Talisman* to draw on helped enormously."

According to Whiteford, using Marmalade made perfect sense for Nomad Games to transition from console development to a cross-platform, mobile future: "It would have taken us many months to produce a version of *Talisman Prologue* for each of our supported platforms, so it's an enormous saving from that point of view. Marmalade has proved time and again that rapid cross platform deployment is achievable. Often, the game worked as a first build on new platforms."

At time of going to press *Talisman Prologue* has reached the number one slot in the RPG and Board Game categories in 27 countries on iOS, and the top 10 in 124 countries. On Android, the game reached the top 10 highest grossing Brain & Puzzle games in 26 countries.

Future planned updates include cross-platform multiplayer, and a range of expansion packs based on the beloved board game series. ■

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HAVOK BUZZ

A look at Havok's past reveals why the future of physics is bright

Havok's David Coghlan (above), and the real Havok ragdolls at GDC (main)

WAY BACK IN 1998, Havok was formed out of a team of lecturers and engineers from the Graphics Research Group of Trinity College in Dublin, Ireland.

Back then middleware barely existed – even Renderware was still new – and so it was that a band of pioneers started to shape not just how physics would be implemented in games, but the very role and status of third-party games development tech.

"What Havok needed to do was not just sell physics to developers, but actually sell the whole idea of middleware, because at that point middleware industry was still really fledgling when it came to games," explains Havok's MD David Coghlan.

"We had to convince people of injecting what they might see as 'alien' technology into their games. Until then projects were entirely made in-house."

> ***"We see our technically ambitious customer base as a good thing; they show the world what's possible with our technology."***
>
> David Coghlan, Havok

TESTING THE WATER

Those early years for Havok were also rather experimental, as the team strived to define what game middleware was. The engineers conceived and created numerous demos offering the likes of fluid and soft body simulation, and a whole range of other technologies that at the time stretched the boundaries of what was possible.

"Many of those concepts would never survive the rigors of full in-depth games production at the time ," admits Coghlan. "In those first few years, we focused on refining down the feature set to the core things developers needed to do in games, and put our effort towards extremely performance-focused reliable physics for things like collision detection, constraint solving and spatial queries and so on."

PIONEERING SPIRIT

And so it was that the company concentrated its effort on refining its physics technology. Things have clearly come a long way since, both inside Havok's walls and across the industry, but that groundwork continues to serve as a foundation for Havok's success.

And, says Coghlan, a great deal of that pioneering spirit at Havok continues to this day.

"Good companies have a personality," he suggests. "And an awful lot of that spirit that Havok had in those early days continues to this day. It still influences the type of people we hire and the decisions that we make. Similarly, we're still very much a technology company and a very flat organisation that trusts in our engineers' ideas."

LOOKING AHEAD

Arguably, such is Havok's longstanding influence over both physics and the very make-up of the middleware model, it has a great hand in the evolution of the games consumers enjoy today.

And that may long continue, as Coghlan and his team strive to continue pushing technology.

Currently Havok's Physics 2013 is undergoing a final polish, and it is already positioned as core to the next generation.

"From our point of view we continue to see a lot of scope to push game play and visuals that are driven from physics. We are always astounded by what teams can do with our technology, such as *Battlefield 3* and the *Uncharted* series.

"They really try to push physics as a core element of the game, and really open up clues about the types of experiences that we can expect from the next generation. Havok is very excited about what our customers will be capable of over the next few years, especially with the hugely scaleable physics that's now possible."

And according to the company's MD, the developers Havok works with have been absolutely critical to its success.

"We'd be nowhere without their constant feedback and support," concludes Coghlan. "Everyone in Havok sees our technically ambitious customer base as a good thing. It's been great to work with all of them, and they're the ones that show the world what's possible with our technology." ■

UPCOMING EVENTS

E3 Expo 2013 – June 11th to 13th
Meeting Room #6801

SIGGRAPH 2013 – July 21st to 25th
Siggraph Speaking Session: 'Mobile Game Creation for Everyone' – July 21st, 9:00am to12:30pm

ChinaJoy 2013 – July 25th to 28th
Booth #W5 B208

GDC Europe and Gamescom 2013 – August 19th to 25th
GDC Europe Speaking Session: 'Overview of Project Anarchy Free Game Engine' – August 21st, 10:50am to 11:50am. Or meet Havok at its **Gamescom meeting room** @ the GDCE lounge

Full list of Havok's upcoming events: ***www.havok.com/events***
To request a meeting with Havok, visit: ***www.havok.com/meeting-request***

Additional information on Havok Physics 2013: **www.havok.com/next-gen**
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KEY CONTACTS

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RECRUITER HOT SEAT

NaturalMotion is behind widely-used tools and hit mobile games. Its talent manager **Emma McGonigle** tells us more

What differentiates NaturalMotion from other development studios?
We have four studios within NaturalMotion: Oxford (our headquarters), London, San Francisco, and Brighton (Boss Alien, makers of *CSR Racing*). All of our studios have actually moved recently, due to expansions in all our various departments, but despite being in new locations, each of them still has their own unique brand of personality, people and culture.

A lot of that is due to where they are located. Our San Francisco office, for instance, is just off Market Street in SoMa, south of Market, and has a classic brick loft feeling. Boss Alien is in Brighton and is a stone's throw from the beach and piers. The London Studio is in the creative hub on the west side of the city, and finally our headquarters in Oxford is in the very centre of the famous university town, close to lots of shops, pubs and the university buildings.

It's really fantastic to be able to place new team members into one of the studios and help them get settled in working on our great games or innovative technology.

How many staff are you currently looking to take on?
We are always looking for exceptional people to join the teams. We have openings across our studio locations from producers to artists, programmers to engineers. In fact, there are very few areas of development that we're not recruiting for right now.

If you join our technology team, you'll be working on some of the most cutting-edge and widely-used products on the market, such as Euphoria and Morpheme, helping shape how the next generation of games evolves.

Our games teams are dedicated to creating the most exciting free-to-play titles in the world. That means we want creative people from all fields to contribute and get involved with how our games are made. There are a lot of exciting projects that successful applicants will be working on, and a lot of them are unannounced for now. Check out our website **www.naturalmotion.com** for all the roles and detailed information.

We also attend many of the UK and US games industry events throughout the year, including this year's Develop Conference in Brighton. If you want to find out more about the company, or just want a chat about what NaturalMotion can offer, we'd love to talk to you.

What perks are available to those working at the studio?
The key benefit that comes with working for NaturalMotion is our approach to development and the amazing things we make. You will be working alongside industry talent and a leadership team who really strive for a specific level of quality, for both games and technology. The experience makes for excellent career growth and there's a real opportunity to really make a strong creative difference, whatever your role.

BIO
Name: Emma McGonigle
Title: Talent Manager
www.naturalmotion.com

GET THAT JOB

Development specialists offer advice on how you can bag that career leap

THIS MONTH: **GRAPHICS PROGRAMMER**

"Knowing Direct3D or OpenGL doesn't make you a graphics programmer; we abstract with engines so specific platform APIs don't matter.

"Understanding principles, algorithms and underlying mathematics is what matters. They're the tools a graphics programmer uses to understand published research, to adapt existing techniques and to invent new ones.

"Pragmatism is a valuable skill; smoke and mirrors are often more appropriate than physical correctness. Players don't mind that your game's baked lighting is only correct at midday, but they do want it to look good and run at 60Hz.

"Communicating well with artists is essential for choosing the best looking tool and making the right trade-offs, and helps avoids many bugs that can be painful to track down."

Simon O'Conner,
Graphics Programmer, Ubisoft Reflections

SIX-SECOND STUDIO SPOTLIGHT

- *Evil27 Games was founded by 'chief evil officer' Kevin Corti*
- The company's goal is to utilise social networks as a means to distribute and 'socially ratify' UGC to help overcome discovery issues
- It has secured initial start-up funding from the Technology Strategy Board and the Birmingham Growth Fund
- Evil27's focus is on mid-core players and tablet devices
- The studio is currently Corti, his wife Lisa and ad hoc freelancers and volunteers, but it will be seeking to expand in late 2013
- Its first game, *Lunar Loot Drop*, will launch this summer on iOS and Android

www.evil27games.com

Because we're focused on the cutting-edge of both mobile gaming and technology tools, no two days are ever the same. Mobile, especially, is an incredibly fast-moving industry, so if you enjoy discovering new things and creating highly original titles, you should definitely get in touch.

Alongside all of these working benefits we also have a range of employment perks for our staff, including stock options, bonus opportunities, team entertainment budget and a comprehensive pension scheme.

> ***"Because we're focused on the cutting-edge of both mobile gaming and technology tools, no two days are ever the same."***
>
> Emma McGonigle, NaturalMotion

Our HR team is always looking for great new local benefits for the studios as well – cut-price gym memberships, cycle to work schemes and special discount offers from local businesses are just some of the recent perks.

The office locations also have geographical benefits. All of our studios are not just central locations in their respective cities, but also close to some of the largest development hubs in the UK and US. They're extremely vibrant places, too, so adding your social life to your work life is never going to be a problem no matter which office you work in.

Who is the best interviewee you have ever had?
Interestingly, some of the best candidates are not always highly experienced and specialist, but really confident, passionate, intelligent and enthusiastic about what NaturalMotion is focused on creating. They did their homework, they knew the landscape, and were clearly enthusiastic – that's the sort of attitude that really gets you noticed, and never fails to impress.

What advice would you give for a successful interview?
Be prepared. Think how you're going to tell us about your passions and skills. Show us what you have achieved to date and where your potential is. Plan what you want to say and help us to get to know you. We want people who are going to be passionate and contribute in a positive way.

If your studio has recruited talent internationally, what was the process like?
It's never easy to move jobs or locations, but it is great experience to try new things, work and live in different surroundings and get to know new people. Depending on where you are relocating from, we will provide you with support in completing the necessary formalities and do our best to help you quickly focus on performing in your new role.

NEW STUDIO ALERT!

STRAIGHT OUT OF Dundee and the University of Abertay is **Future Fossil Studios**.

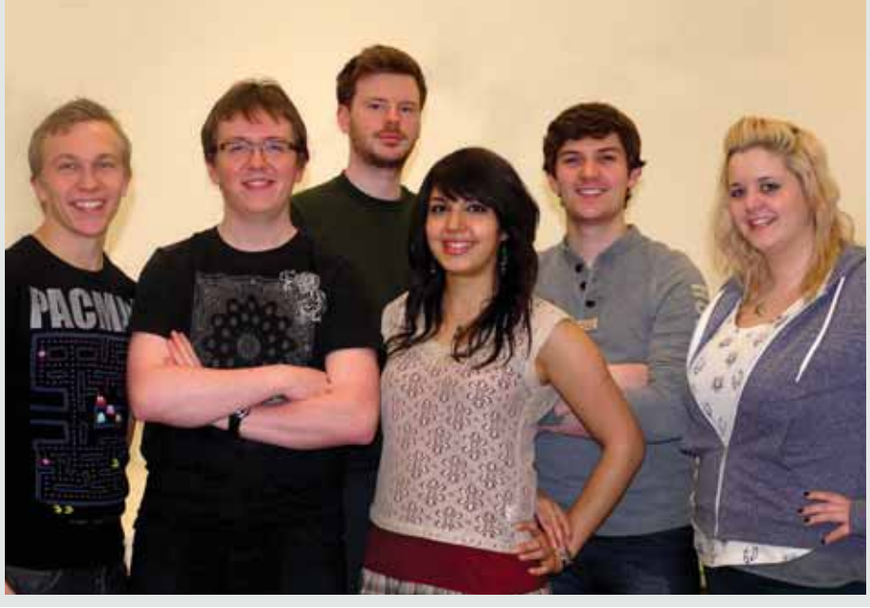
The group formed after graduating from their Masters course in Games Development, director Daniel Falconer (*third from left*) tells *Develop*.

"Having worked in small teams for a year, we all felt that we wanted to keep that scale of development going, while enjoying the challenges presented in trying to establish ourselves," he says. "We applied to Abertay's Prototype Fund in 2012 and moved into the prototyping space in January of this year. Without the support provided from the fund, it would have been a harder journey to where we are today and it has provided us a platform from which to move forward."

It's home to five founding members, as well as Falconer himself: Philip Barrowclough (*first*), Stefen Rodger (*second*), Marnie Faulkner (*four*), Donald Hicks (*fifth*) and Rosemary Henderson (*sixth*). Future Fossil is currently using Unity to develop small mobile products for Android and iOS, such as its upcoming snowboarding title, as well as focusing on testing free-to-play social games.

"Our plan is to keep working hard and to continue developing and releasing products," says Falconer. "We're really interested in working with new partners to develop great games. The obvious aim is to create a sustainable business from which we can grow in the coming years."

www.futurefossilstudios.com



MOVERS AND SHAKERS

This month: 22Cans, The Audio Guys, InnoGames and Reflections

22CANS ■ Former Ubisoft Singapore level and mission design director **JAMIE STOWE** has returned to the UK as technical designer at 22Cans.

In his new position at Peter Molyneux's Guildford-based studio, Stowe will be working on the developer's crowdfunded god game, *Godus*.

"Jamie joins 22cans at a very exciting time and takes the role of technical designer on the current Kickstarter funded project 'Godus'," 22Cans head of production Jemma Harris told *Develop*.

"The team were very impressed with Jamie's knowledge and experience so far in the games industry, which includes titles such as *Assassin's Creed*. We feel that Jamie has the experience and skills to become an asset for 22Cans [and its titles]."

Stowe had previously worked at Ubisoft Singapore since 2009 in a number of level design roles. As level design director, Stowe mentored and managed 15 designers, and also lead development on *Assassin's Creed III*'s naval battles, as well as designing the accompanying E3 demo.

Prior to joining Ubisoft, he worked as QA team lead and later as level designer at Codemasters, working on titles such as *Operation Flashpoint: Dragon Rising*.

In November 2012, he was also named in *Develop*'s annual 30 under 30.

THE AUDIO GUYS ■ **MIKE DE BELLE** has joined games audio production house The Audio Guys as a sound engineer.

"I am thrilled to be joining The Audio Guys. It's a fantastic opportunity. I've kept a close eye on TAG since their inception in 2006 and have always kept abreast of their progress and the titles they work on," Mike de Belle told *Develop*. "I look forward to building on their success and to helping create and develop compelling audio."

De Belle has over 14 years experience in creating audio for games, having worked at SCEE, Codemasters and Bizarre Creations.

TAG's director Dan Gardner said: "We are very happy to welcome Mike to The Audio Guys. He brings years of experience and games audio knowledge to the company and has some great titles under his belt, and, most importantly, his sense of humour fits right in too."

INNOGAMES ■ Hamburg-based online games company InnoGames has taken on two new senior staff to reinforce its commercial and creative teams. **MARK GERBAN** (*left*) joins as the new head of payment and **ALEXANDER RAPHELT** (*right*) as head of graphics.

In his role, Gerban will oversee contact between international payment providers and InnoGames and report to CFO Armin Busen.

"The international recognition and success have attracted me to InnoGames," said Gerban. "The share of our non-German players is already more than 90 per cent, according to international course payments related to location. Therefore, it is a very exciting job for me to help shape the further process of internationalisation in the payment area significantly."

Raphelt, 33, will be responsible for 18 artists at InnoGames and reports to the chief creative officer Eike Klindworth.

Raphelt commented: "I am very excited to continue to connect my two great passions at InnoGames: art and games. InnoGames has many very talented graphic designers, I am pleased to support them in their development. Technologies such as Flash or Unity have made sure that browser games are becoming more demanding graphically. To direct the graphics department at InnoGames therefore is a very exciting job."

Gerban was previously director of business development and payment at Gamigo. Before entering the games business, he was a professional athlete, competing for Palestine.

Raphelt found his own company, Flow Studios, and has previously worked as a 2D and 3D artist for Gameforge, as well as a lecturer at the Games Academy in Germany.

REFLECTIONS ■ Student **MIKE PICKTON** has secured a job at Reflections.

The 24-year-old De Montfort University Game Art Design student from Lutterworth will take up the position of technical artist this summer – but first, he's still to complete his university diploma.

As a technical artist, Pickton will act as a bridge between the artists and programmers working on games at the Ubisoft-owned studio in Newcastle.

"I knew Ubisoft were looking for a technical artist, but it's rare for a graduate to be considered. I thought I was trying my luck in applying, but when they told me I would be perfect for the job I was stunned," said Pickton.

"Everyone who has owned a console in the last 15 years will probably be aware of Ubisoft, and the hugely successful *Driver* series that is designed here in the UK. I can't wait to get started in my new role."

Michael Powell, head of Game Art and Animation at DMU, added: "We are delighted for Mike and he joins a long line of our graduates getting jobs in this highly competitive and creative industry."

Services & Tech Recruiter Hot Seat

RealtimeUK's account director **Dave Cullinane** explains what opportunities there are in CGI production

What makes RealtimeUK different from other computer-generated imagery firms?
RealtimeUK is different from other CG companies in that we are one of only a handful in the world that specialises in creating premium quality cinematics, animation and marketing imagery services that are specifically tailored for the games industry.

Both publishers and developers of games use us throughout the development of a game and for its eventual marketing. I think we're often mistakenly seen by many in the industry as 'the trailer guys', but the truth of the matter is that much of our work never gets to see the light of day, as our team is used to creating benchmark movies and imagery that are used as part of pre-production for a game.

What benefits do you offer employees?
RealtimeUK's purpose built studio in Lytham, Lancashire, offers a great environment to work in – it overlooks a farm so it's quite idyllic. Then again, for those wanting to work in the city our new Manchester studio offers all the trappings of urban life. We offer free fruit and there are regular organised social outings as well as a work pension plan.

What disciplines are you in need of?
Right now we're on a major recruitment drive but we're always glad to hear from talented individuals with experience of creating high quality CGI. We're also keen to grow our freelance network, so if there are any individuals who aren't able to commit to working for us full-time at our studio, please do send your showreel link to us.

With next-gen on the horizon, have your recruitment needs changed?
In terms of skill sets, it hasn't really affected us. We've always aspired to be the best in class in terms of quality and have always strived to build an experienced team around this core value. This is why so many developers are approaching us with next-gen projects, confident in the knowledge that we be able to achieve the level of quality that next-gen demands.

What opportunities are there for career progression?
We have clear progression plans for all staff so juniors can progress to senior, lead or director roles. Each of our juniors is assigned a mentor who oversees their development. The mentors have had a lot of experience in creating CGI with some of them having played a pivotal role in the company's growth over the last 16 years – that's a lot of expert knowledge to pick up and learn from.
www.realtimeuk.com

Neon Play

Cirencester, UK
www.neonplay.com

Look inside Neon Play, and you get some idea of why it was recently given the Queen's Award for Enterprise. Fun and work go hand in hand. Exercise balls for seating. Maps for charting their world-dominating efforts. Ping pong or pool for settling those creative debates. And *FIFA* for when the grafting's done.

THIS IS **WHERE WE WORK**

Bungie

Bellevue, Washington, USA
www.bungie.net

The Bellevue offices of *Halo* creator, Bungie, have been formed out of a large converted multiplex theatre, and as such, it's defined by wide, open work areas, spacious hallways and at least one cinema-sized gaming lounge.

SERVICES SPOTLIGHT

This month: **Wave Studios**

WAVE STUDIOS PROVIDES all-inclusive audio productions for developers both large and small.

Founded in 1999, by award-winning sound designers Warren Hamilton and Johnnie Burn, Wave has built a strong reputation in the filmmaking and advertising sectors. In 2010, it opened a dedicated gaming division to handle developers' sound design requirements.

"Our extensive experience with different types of media, be it film, TV, radio or design give us a unique perspective on sound design and creativity," Wave's head of game audio Anthony Matchett (*right*) tells us. "We're lucky enough to have some of the most creative and highly-awarded sound designers on our staff. Their passion and experience helps us to remain a step ahead of our competition."

Its services include casting, voiceover recording, on-location recording, facial performance capture, talent direction, creative direction, sound design, mixing and implementation.

Recently, Wave has provided full audio services to Microsoft Soho Productions for both seasons of *Kinect Sesame Street TV*, which included all aspects of audio production for the title. Audio work that has also earn it a Develop Award nomination for two year running to date.

"We understand the differences between linear and interactive material, yet, at the same time, our team of producers leverage their experience in film and TV when dealing with production budgets, scheduling and pipelines. Our aim is to provide a smoother, more efficient and higher quality service," says Matchett. "Secondly, our size has great benefits when it comes to capacity. At our building in Soho we currently have eight studios, each with individual recording booths. We also have another three studios at our complex in Amsterdam. Personally, I don't know of any other audio providers in London, or the UK for that matter, that can provide the industry with as large a scope for recording and sound design as we do."

In providing its audio expertise, Wave uses a variety of tools and custom technology, including ProTools and Nuendo for recording and design, and Wwise for implementation. Currently, it's working on some several projects

Wave's London recording studio is fitted with Fairlight, Avid and SSL hardware with Neve pre-amps

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ranging from mobile to triple-A next-gen titles for various developers.

Wave is in the process of refurbishing its London building as well as looking at expansion possibilities outside of its existing European studio in Amsterdam. And on the digital-end, its website is due to be refreshed too.

> ***"Our extensive experience with different types of media, give us a unique perspective on sound design."***
>
> Anthony Matchett, Wave

"Often the thought process behind outsourcing varies from client to client," concludes Matchett. "Some of our clients lack audio staff within their studio; obviously, in situations such as this the value we bring is clear. In essence, we become their external audio department.

"In other instances, our clients are looking for a higher quality of audio than they are currently achieving in-house, or they are looking to compliment their existing audio team with our services. Something that we are hearing much more from our clients is that they are hoping to create a more cinematic experience with their titles. Although that particular statement is often contravened by the nature of interactivity, our pedigree with TV and film helps us maintain a fresh creative outlook and style."

Blitz Games Studios **01926 880000** **www.papertitans.com**

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TOOLS SPOTLIGHT

This month: **Turbulenz**

THE NEXT STEP in scalable development with the potential to reach myriad audiences is HTML5.

It's a shift that boutique middleware firm Turbulenz sees great prospects in, and by making its self-titled game engine open source, it intends for you to benefit too.

Founded in 2009 by James Austin, David Galeano and Gavin Shields, Turbulenz' aim is to create an online platform for games with portability across all devices and instant access to content – the Kindle or Netflix for games, it says, if you will.

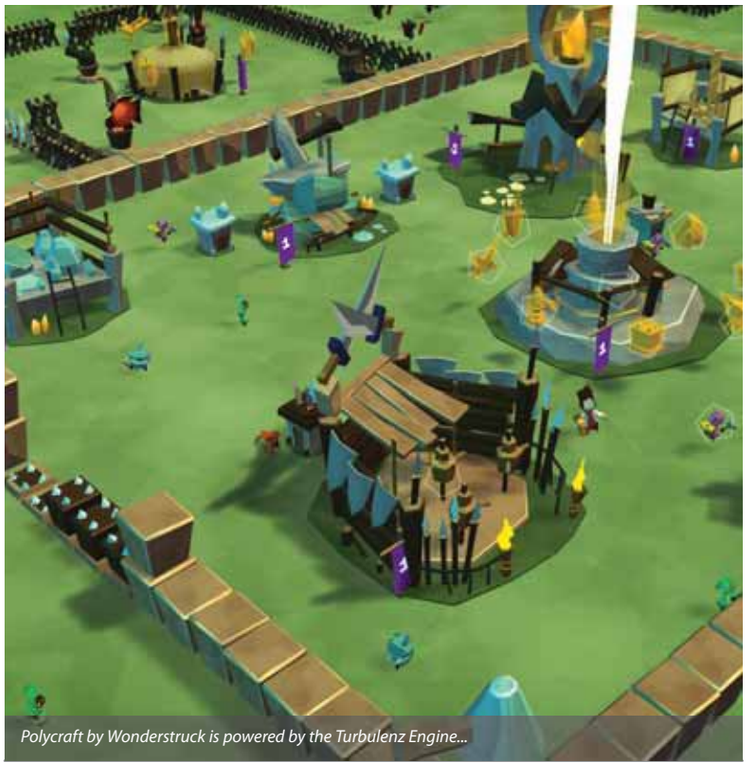
The Turbulenz Engine is a full featured games engine implemented in TypeScript and available as a JavaScript library. It uses modern HTML5 features such as WebGL and typed arrays to deliver a hardware-accelerated and data driven 2D and 3D engine, which is also integrated with web service APIs and its own developer hub to create a complete platform for developers online.

"The main difference from other engine technologies is the language it is implemented with and the application platform that enables it," CEO James Austin (*right*) tells *Develop*.

"As the Turbulenz Engine is implemented with TypeScript and JavaScript it runs natively on the web application platform. This means that it runs in a browser without requiring a plug-in. Whereas, classic C++ or C# engines would require a binary installation or some form of language translation to run online. This is a significant architectural difference and results in different degrees of portability for both types of engine."

> ***"The main difference is the language the engine is implemented with and the application platform that enables it."***
>
> James Austin, Turbulenz

Early adopters of Turbulenz technology include Wonderstruck, which created the 3D arcade strategy game *Polycraft*, Xona and its four-way



Polycraft by Wonderstruck is powered by the Turbulenz Engine...

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...as is BAFTA-winning Save the Day by Denki

multiplayer shooter *Score Rush* and Denki with its BAFTA-winning 2D arcade game *Save the Day*.

Turbulenz opened up its engine, SDK and publishing pipeline in May, and Austin says this another defining aspect of its offering.

"Obviously being open source is a significant difference as well as it is a huge positive for many developers when evaluating technology. Almost all current generation engines are closed source. But the difference here is that HTML5 is a software platform that will continue to grow. The Internet and the web flourished because of open standards and open source technology. We hope that by open sourcing the Turbulenz Engine we can help accelerate the adoption and growth of HTML5 as a pillar of the games industry.

At the time of writing, the Turbulenz team was just finishing off a solution to power asynchronous multiplayer games and for packaging HTML5 games as native applications for Android and iOS. "Developers want to create games that span the most popular devices and allow users to play with their friends. These two features nail that request," Austin comments. Turbulenz next focus is getting the tablet and mobile support polished and released.

The engine, Austin says in summary, brings true desktop-quality production to the web platform.

"The Turbulenz Engine is a feature-rich framework that developers can depend upon to building portable online games that people can play with their friends across a range of devices."

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Images courtesy of Criterion Games

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"After some years working as a programmer, I decided to attend the MSc in Games Programming at Hull University. It was probably the best investment of my life. Now I'm a programmer at an AAA studio." Manuele Bonanno, MSc Graduate

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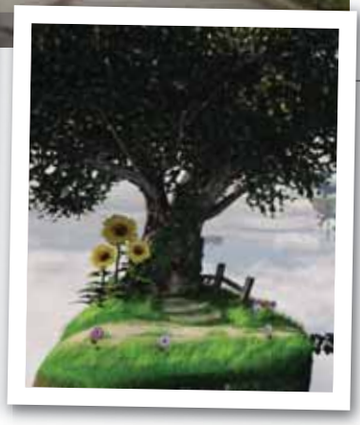
TRAINING SPOTLIGHT

This month: **Staffordshire University**

Alumni of Staffordshire have gone on to work at Naughty Dog, Rockstar North and Playground Games



STAFFORDSHIRE UNIVERSITY'S GAMES courses are intend to give students a tailor-made experience directed at clearly defined roles within the industry.

Its flagship award is the Skillset-accredited BSc Computer Games Design, which is supported by courses in Gameplay Design and Production and Games Technical Art.

Staffordshire's track record in educating the next generation of games creators stretches back to 2004, and its current students have demonstrated what can happen when talent is aided by experienced staff. Two full teams successfully made it through to Dare to be Digital 2012, with one team being selected for the final at the BAFTAs. And in April, Kairos Games – a team fielded by Staffordshire students – came second in the Make Something Unreal Live 2013 competition, and was awarded an Unreal Engine 3 licence for its efforts.

"At Staffordshire University we are constantly striving to build connections and engage in ongoing dialogue with developers and our contacts in studios, to ensure we are constantly meeting the recruitment needs of the industry," its senior lecturer in games design David Edwards (*right*) tells *Develop*. "By teaching real skills and not software, we can ensure that our students can be a real asset to employers. By encouraging students to take responsibility for their learning to develop self-motivation and a willingness to constantly improve, we push every student to leave the course with a positive exit trajectory."

> ***"By teaching real skills and not software, we can ensure that our students can be a real asset to employers."***
>
> David Edwards, Staffordshire University

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Artwork by Matt Southall

A 3D level concept by Adam Spriggs

The first year is intended to help students find their feet, giving them a taste of everything from modelling and texturing to level design and animation. Team-based modules in the second and third year allow students to gather experience in an industry-like environment. Students have the opportunity to work in large groups to produce up to three titles, all with original content. Third year students work in senior roles, with second year students fulfilling the junior roles.

"This not only builds team working skills, but also gives the students ownership over their projects and encourages collaborative learning and team reflection," says Edwards.

As for its technical kit, the university stays up to date with the latest software and hardware, with a clutch of licences for Autodesk Creation Suite, Pixologic ZBrush, Adobe Creative Suite Create, UDK and 3D Coat. It primarily uses Unreal Technology, but also has access to other engines such as Unity and CryEngine. And a rare Vicon Motion Capture Studio is also used to produce realistic animations in the group games development projects.

Staffordshire's roll call of alumni includes Mike Knowland, lead character artist currently working on *The Last of Us* at Naughty Dog; Adam Spriggs, Ben Jackson and Tom Laird now at Rockstar North; and Ben Wilson at Playground Games, to name just a fraction. The university is now looking to develop its course further with more accreditation and partnerships.

"We are constantly reviewing our course content, and will continue to do so, to keep pace with the world's fastest moving industry," Edwards explains. "Unreal Engine 4 and the latest consoles will provide a challenge to all aspiring games developers. The course has recently been redeveloped to further focus on artistic skills, and Unreal Technology to ensure the transition to the new technology is as seamless as possible. Hopefully our work with Epic on Make Something Unreal Live will give us access to a large knowledge base who will have experience with the new upcoming technology."

develop FORWARD PLANNER

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We analyse the global immigration trends impacting games developers, and talk to the field's experts

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AUGUST 2013

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Touch screens and gesture inputs have changed how gamers interact. But how have they changed how games are made?

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THE FAQ PAGE: JON HARE

Develop grills respected figures from the global games industry

Who are you and what do you do?
My name is Jon Hare. I was co-founder and owner of Sensible Software, and for many years have been a games design and business consultant within the games industry.

What are you working on right now?
I am working on two games right now with my development colleagues at Vivid Games. The first game is an update to our successful release of an all-time classic *Speedball 2 Evolution*. The second title is my first properly original game for 17 years and I am very excited about it. It is called *Word Explorer* and is a gigantic word game in which you explore the world, taking thousands of beautiful photos.

What was the first video game or product that you ever worked on in the industry?
The game was called *Sodov the Sorceror*. It was a conversion onto Commodore 64 of an old game called *Gandalf*; I drew some sprites.

What was the first video game you ever played, and did you enjoy it?
Back in 1976, when I was about ten, I remember a school fete where a version of *Pong* was playing in one of the classrooms. I had a go and quite liked it, although there was no prize like the hoopla and stuff, so it didn't grip me for too long.

What was the most recent video game you ever played, and did you enjoy it?
I was playing *Flow Free* about an hour ago on my iPhone. I like the game and find it very relaxing, although sometimes the ads annoy me.

What is your favourite game ever, and for what reason?
What a hard choice. I think my favourite ever game was probably *Heroes of Might and Magic 3* on the PC.

In general, I prefer turn-based games against AI or fast human competitors, where I have time to think. I love the subject matter. *Skyrim* and *World of Warcraft* are also both favourites of mine. More than anything, the level design is almost perfect and the game mechanics are easy to use and brilliantly balanced.

How many hours a week do you spend playing video games?
I think about three hours on average.

What area of the industry do you feel needs more 'investment'?
In my opinion, we need more investment in old-style publishing models to open up mid-price gaming again. Currently, we are stuck between the closed shop of triple-A games that cost £39.99 and free-to-play games, which are made to appeal to everybody in the hope that the dumbest or most impulsive five per cent will actually pay for them.

Jon Hare (right) is most famous for his work on games like Sensible Soccer and Cannon Fodder, but continues to develop to this day

What do you enjoy about the video games industry today?
I enjoy the fact that we are becoming acknowledged more by the media at large as something serious and here to stay.

What disappoints you about the video games industry today?
The inadvertent sabotage of the art form of making games by hardware companies, service companies, accountants, financiers and other middlemen trying to extract their slice with no care for the evolution of the products on offer.

We have been cornered into making increasingly dumbed down, free games. However you argue that a zero price point fundamentally devalues the art of game making, and also creates a big restriction on the type of games you can create which are commercially viable.

Meanwhile, well over 80 per cent of developers making original games will earn next to nothing for their efforts and either go out of business or make shovelware for the rest of their lives.

Of all the games you have worked on, which has been your favourite to work on?
My favourite game to make was *Sex 'n' Drugs 'n' Rock 'n' Roll*, but of course it never came out. I would also name *Mega Lo Mania, Sensible Soccer* and *Wizkid* as my favourites to make.

What game that you were not involved with would you most liked to have worked on?
World of Warcraft. It was truly ground-breaking and brilliant.

What other video games developer do you most admire?
Shigeru Miyamoto. He is by a country mile the best games designer the world has ever seen. I think there a quite a few people around the world, myself included, a level down from him, but he is up there on his own, as are Nintendo.

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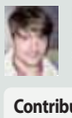
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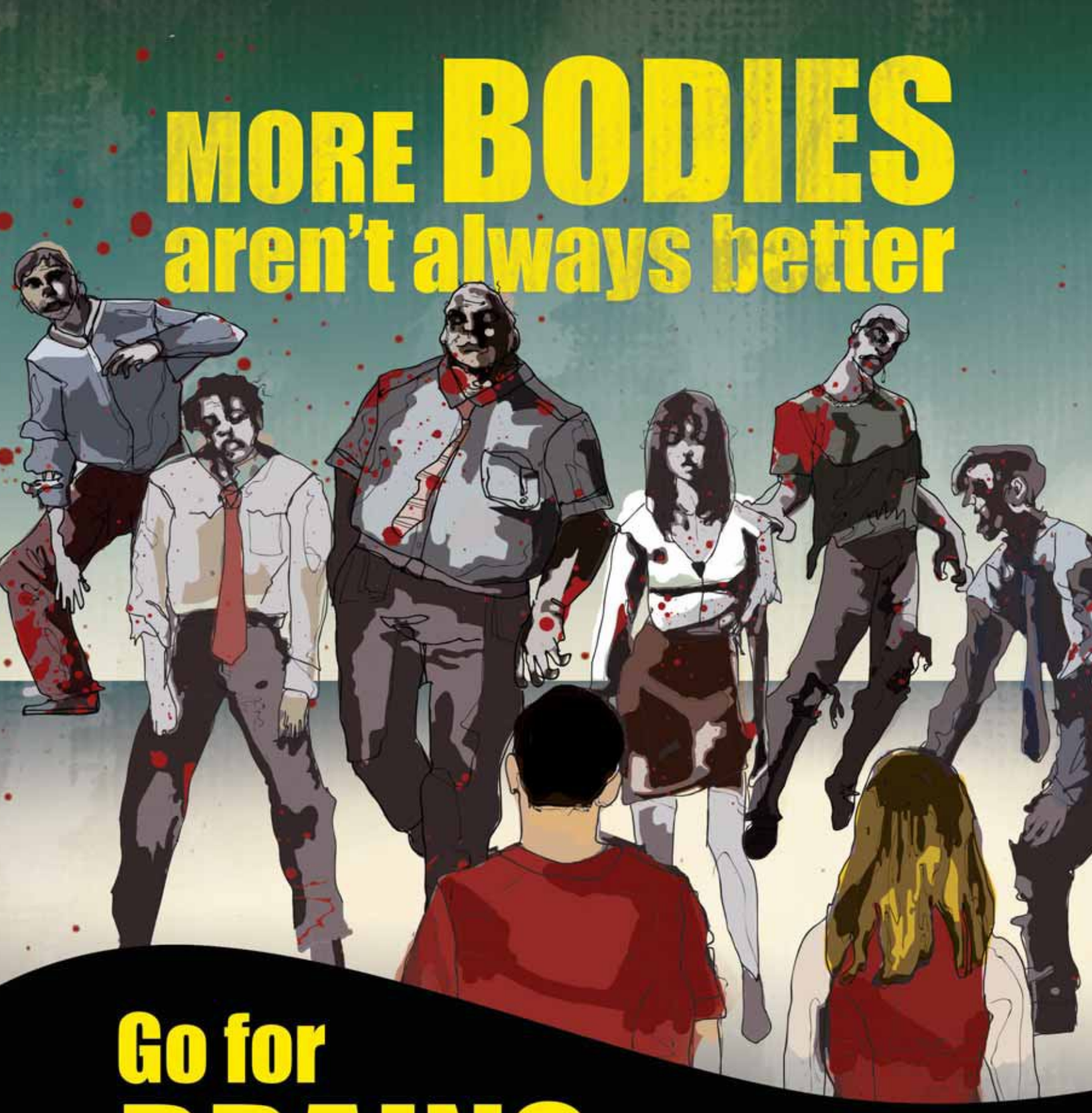

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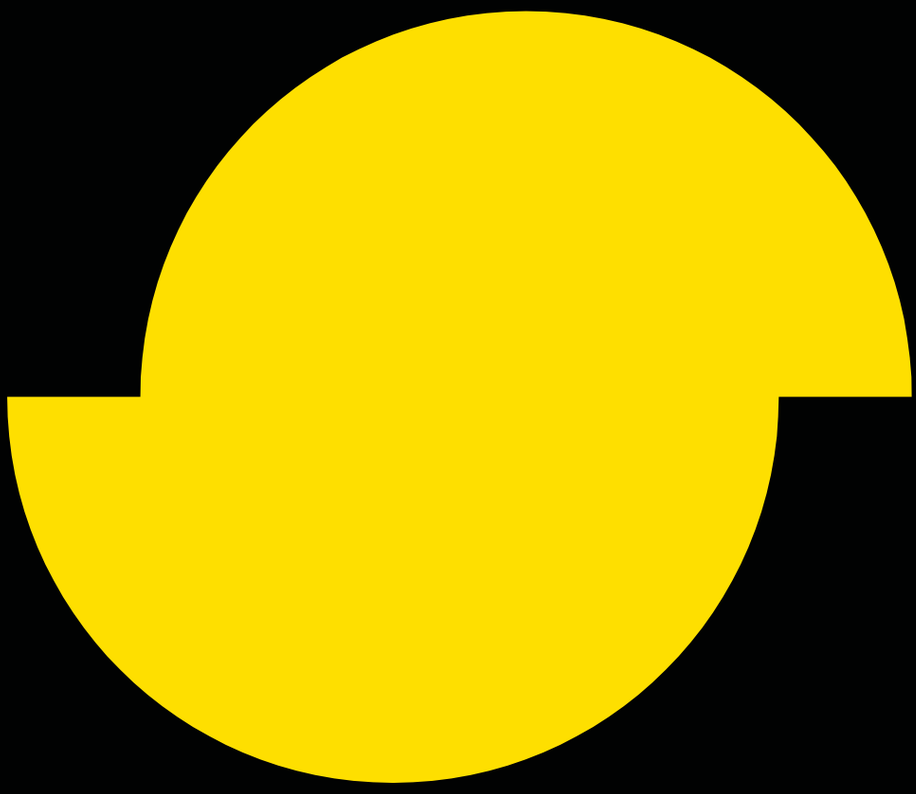

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